10th ASIAN & OCEANIAN EPILEPSY CONGRESS

Singapore, 7th - 10th August

FINAL PROGRAMME AND ABSTRACT BOOK

IBE

INTERNATIONAL LEAGUE AGAINST EPILEPSY

ILAE

ESTABLISHED 1909

www.epilepsysingapore2014.org

31st International Epilepsy Congress

Istanbul, Turkey

5th - 9th September 2015

31st International Epilepsy Congress
5 - 9 September 2015
Istanbul 2015

INTERNATIONAL LEAGUE AGAINST EPILEPSY
Established 1909

IBE

www.epilepsyistanbul2015.org

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WELCOME MESSAGE FROM THE SCIENTIFIC ORGANISING COMMITTEE CHAIRS

Dear Friends and Colleagues ,

On behalf of the Scientific Organising Committee, we are delighted to welcome you to the 10th Asian & Oceanian Epilepsy Congress (AOEC) taking place in the fascinating city of Singapore in the coming days. This Congress has been organised by the regional organisations of the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE).

The Scientific Organising Committee and the Scientific Advisory Committee have been working arduously to prepare an exceptional scientific programme with international appeal that has high quality teaching on the pertinent topics of today. We invite you to attend the Chairman's Symposium on "AED tolerance and resistance" on Friday morning and trust that all of you find presentations of interest in the other main sessions on "Epilepsy burden", "Neuro-stimulation in the treatment of epilepsy" and "Electrophysiological markers of the epileptogenic zone".

Ultimately the scientific programme of the 10th AOEC has been built on the success of its' predecessors featuring a comprehensive mix of post-main and parallel sessions, didactic lectures, video quizzes, debates, forums, workshops and teaching courses. Among new features in this Congress is the Tournament of the Brainwaves quiz which we hope will be educational and fun for all, a highly interactive session on ILAE classification and an informative session on how to get your paper published.

The Epilepsy and Society Symposium will take place on Saturday and this year includes a mini fair. This programme will be of great interest to both individuals living with epilepsy and for staff from community organisations supporting people living with epilepsy.

Make sure to attend the platform and poster sessions featuring the latest research and data on epilepsy; the quality of papers submitted this year was particularly high. The two best platform and two best poster presentations will receive the Tadokoro Award on Sunday.

Singapore is a beautiful and cosmopolitan city, rich in contrast and colour. Yet despite it being a metropolis of glass and steel, Singapore has recently been ranked as the greenest city in Asia. The city is home to a diverse range of ethnicities, with many different languages, cultures, religions and gastronomic delights. Indeed on Saturday when the country commemorates its' National Day you will get the perfect opportunity to experience all that Singapore has to offer. So after a fulfilling day of Congress sessions, you will be able to soak up the atmosphere of the city abuzz with celebrations and watch the spectacular fireworks light up the night sky.

We look forward to seeing you here in Singapore for what promises to be an epilepsy meeting of excellent quality in the centre of Asia.

With warm regards,

Byung-In LEE (South Korea)
Co-Chair
Scientific Organising Committee

Shih Hui LIM (Singapore)
Co-Chair
Scientific Organising Committee

Vinod SAXENA (India)
Co-Chair
Scientific Organising Committee

WELCOME MESSAGE FROM THE PRESIDENTS OF THE INTERNATIONAL LEAGUE AGAINST EPILEPSY (ILAE) AND THE INTERNATIONAL BUREAU FOR EPILEPSY (IBE)

Dear Friends,

On behalf of both the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE), it is our pleasure to welcome you to Singapore for the 10th Asian & Oceanian Epilepsy Congress (AOEC).

The ILAE and IBE brought the International Congress for Epilepsy to Singapore in 2007 and we are delighted to return to this wonderful country and experience the richness of its multicultural society. Both the ILAE and IBE have grown considerably since we were here seven years ago but there are still countries in this region without either an ILAE chapter or an IBE association. This Congress will give us an opportunity to meet with future members and to learn how we can serve better our existing members in improving the quality of care and the quality of life of people with epilepsy.

We commend the members of the Scientific Organising Committee for producing an outstanding scientific programme that covers a diverse range of topics and encompasses recent scientific, clinical and social advancements in the field of epilepsy. But knowledge is not just confined to the session rooms. In line with the tradition from previous joint ILAE-IBE congresses, the 10th Asian & Oceanian Epilepsy Congress will provide an excellent opportunity for networking, renewing old ties, making new friends and inspiring and creating new projects for your community.

Singapore is a bustling cosmopolitan city of high-rise buildings, landscaped gardens and heritage-rich precincts. Home to a harmonious blend of culture, cuisine, arts and architecture, Singapore is rich in contrast and colour and it embodies aspects of both East and West in many interesting ways. We do hope that the Congress will also represent an opportunity for you to explore this remarkable place at a time when the country is alive with celebrations for National Day this Saturday (9th August).

We look forward to meeting you over the coming days and we wish you a memorable and educational experience here in Singapore.

With our best wishes,

Emilio PERUCCA (Italy)
President ILAE

Athanasios COVANIS (Greece)
President IBE

Final Programme

GENERAL CONGRESS INFORMATION

SCIENTIFIC ORGANISING COMMITTEE

Byung-In LEE (South Korea), Co-Chair
Shih Hui LIM (Singapore), Co-Chair
Vinod SAXENA (India), Co-Chair

Josephine CASANOVA-GUTIERREZ (Philippines)
Derrick CHAN (Singapore)
Robert COLE (Australia)
Kabhindra Man PRADHAN (Nepal)
Chong Tin TAN (Malaysia)
Tatsuya TANAKA (Japan)

SCIENTIFIC ADVISORY COMMITTEE

Derrick CHAN (Singapore), Co-Chair
John DUNNE (Australia), Co-Chair

Wendyl D'SOUZA (Australia)
Dede GUNAWAN (Indonesia)
Yushi INOUE (Japan)
Patrick KWAN (Hong Kong)
Shichuo LI (China)
Weiping LIAO (China)
Kheng-Seang LIM (Malaysia)
Gouming LUAN (China)
Man Mohan MEHNDIRATTA (India)
Ernest SOMERVILLE (Australia)
Jing-Jane TSAI (Taiwan)

GENERAL CONGRESS INFORMATION

FACILITIES TIMETABLE

	Thursday	Friday	Saturday	Sunday
Registration	07:30–18:30	07:00–18:00	07:00–18:00	07:30–13:00
Speakers Room	07:30–17:30	07:00–17:30	07:00–17:30	07:30–11:00
Posters on Display	–	09:00–17:00	09:00–17:00	–
Exhibition	**	09:00–16:30	09:00–16:30	–
Coffee Break Morning	–	10:30–11:00	10:30–11:00	10:30–11:00
Coffee Break Afternoon	–	16:00–16:30	16:00–16:30	–
Lunch	–	12:30–13:30	12:30–13:30	–
Internet Area	–	09:00–16:30	09:00–16:30	09:00–12:00

** Exhibition stands on level 4 may be open during the afternoon and evening of Thursday 7th August during sessions and the Welcome Ceremony and Reception

ACCOMMODATION AND TOURS DESK

Should you wish to arrange additional accommodation or tours of Singapore or beyond, members of Travel Central can be found at their hospitality desk in the hotel lobby on the ground floor of the Grand Copthorne Waterfront Hotel from 10:00-18:30 each day of the Congress.

BUSINESS CENTRE

A Business Centre is situated on level 3 of the Grand Copthorne Waterfront Conference Centre.

CERTIFICATE OF ATTENDANCE

A Certificate of Attendance will be available for all delegates for collection from the registration area on level 3 of the Grand Copthorne Waterfront Conference Centre on Saturday and on Sunday.

CLOAKROOM

The Concierge on the ground floor of the Grand Copthorne Waterfront Hotel can take suitcases and other small items of all 10th AOEC delegates subject to the availability of space.

GENERAL CONGRESS INFORMATION

COFFEE BREAKS

Coffee and tea will be served in the exhibition areas on level 2 and on level 4 of the Grand Copthorne Waterfront Conference Centre from 10:30–11:00 on Friday, Saturday and Sunday and also from 16:00–16:30 on Friday and on Saturday.

CONGRESS SECRETARIAT OFFICE

Members of the Congress Secretariat can be contacted at the registration area which is located in the foyer of level 3 in the Grand Copthorne Waterfront Conference Centre. For queries arising after the Congress, please contact:

10th Asian & Oceanian Epilepsy Congress,
ILAE/IBE Congress Secretariat,
7 Priory Office Park, Stillorgan Road,
Blackrock, Co. Dublin
Ireland.
Tel: +353 1 2056720
Fax: +535 1 2056156
Email: singapore@epilepsycongress.org
Website: www.epilepsysingapore2014.org

EXHIBITION

A trade exhibition will be held in conjunction with the 10th AOEC. This is an integral part of the event, offering delegates the opportunity to learn about the latest developments in products and services relevant to the field of epilepsy. The exhibition area is located in the foyers of level 2 and level 4 of the Grand Copthorne Waterfront Conference Centre.

INTERNET AREA

There are a few internet stations located within the exhibition area in the foyer of level 2 of the Grand Copthorne Waterfront Conference Centre. Please note that these internet stations are open during exhibition hours only.

LANGUAGE

English is the official language of the 10th AOEC.

GENERAL CONGRESS INFORMATION

LIABILITY AND INSURANCE

The International League Against Epilepsy (ILAE), the International Bureau for Epilepsy (IBE) and its agents do not accept any liability whatsoever for death, personal injury, accidents, theft, loss or damage to persons, property or belongings of participants or accompanying persons, either before, during or following the Congress, tours or their stay in Singapore. It is therefore recommended that participants arrange their own personal health, accident and travel insurance.

LUNCH

Lunch will be served in the exhibition area located in the foyers of level 2 and level 4 of the Grand Copthorne Waterfront Conference Centre on Friday and on Saturday.

POSTERS

Posters are on display in the Veranda Rooms on level 2 of the Grand Copthorne Waterfront Conference Centre. Posters will be on display from 09:00-17:00 on Friday and on Saturday. Poster presenters are required to set up their posters between 08:00-09:00 on Friday morning. Posters must be removed between 17:00-18:00 on Saturday. Presenting authors must be in attendance at their posters on Friday and Saturday from 12:30-13:30.

REGISTRATION

The registration area is located in the foyer of level 3 in the Grand Copthorne Waterfront Conference Centre. Congress bags can be collected from this point. Please note that name badges must be worn at all times.

SMOKING POLICY

The Grand Copthorne Waterfront Conference Centre is a non-smoking area.

SPEAKERS ROOM

The Speakers Room is located in the Seagull Room on level 2 of the Grand Copthorne Waterfront Conference Centre. Facilities to review and amend presentations will be available to all speakers and those presenting a platform session. Please note that all speakers and platform presenters should submit their final power point presentations to the main desk in the Speakers Room no later than 2 hours in advance of their session. Speakers in early morning sessions are required to submit their material before 17:00 on the day prior to their scheduled session.

GENERAL CONGRESS INFORMATION

SPONSORS

The International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE) and the 10th Asian & Oceanian Epilepsy Congress Scientific Organising Committee (AOEC SOC) would like to thank the Singapore Tourism Board for their contribution to the 10th AOEC.

Pharmaceutical Sponsors

Silver Sponsor:

Sponsors:

These companies have provided funding towards the costs of the Congress, but have had no input into or influence over the programme schedule or content. Sponsoring companies' staff will be present at the Congress and sponsoring companies may have exhibition stands promoting their products.

Other Sponsors:

The official airline network for the 10th AOEC is The Star Alliance™ member airlines.

GENERAL CONGRESS INFORMATION

VENUE INFORMATION

The 10th AOEC will be held at the Grand Copthorne Waterfront Conference Centre.

Venue address
Grand Copthorne Waterfront Conference Centre,
392 Havelock Road,
Singapore 169663
Website: www.grandcopthorne.com.sg

WELCOME CEREMONY AND RECEPTION

The Welcome Ceremony of the 10th AOEC will take place in the Grand Ballroom on level 4 of the Grand Copthorne Waterfront Conference Centre on Thursday at 18:30. This super event will give you a chance to learn more about the many activities of ILAE and IBE as well as about Singapore and its' culture.

Following the Welcome Ceremony, all delegates are invited to join the Welcome Reception which will be held in the foyer on level 4; it is the perfect opportunity to catch up with friends and colleagues from the region and beyond.

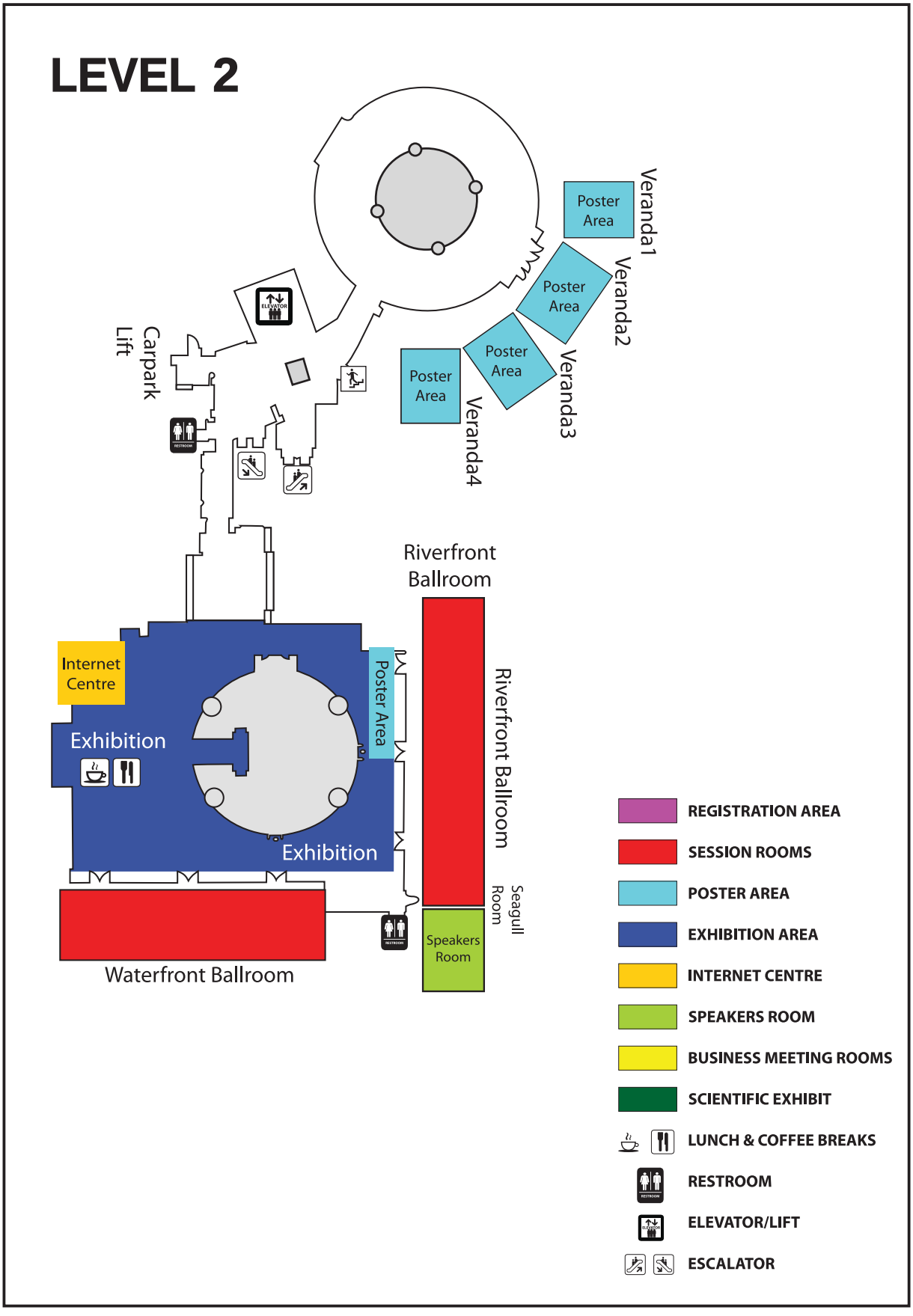
WHEELCHAIR ACCESS

All conference rooms in the Grand Copthorne Waterfront Conference Centre are wheelchair accessible.

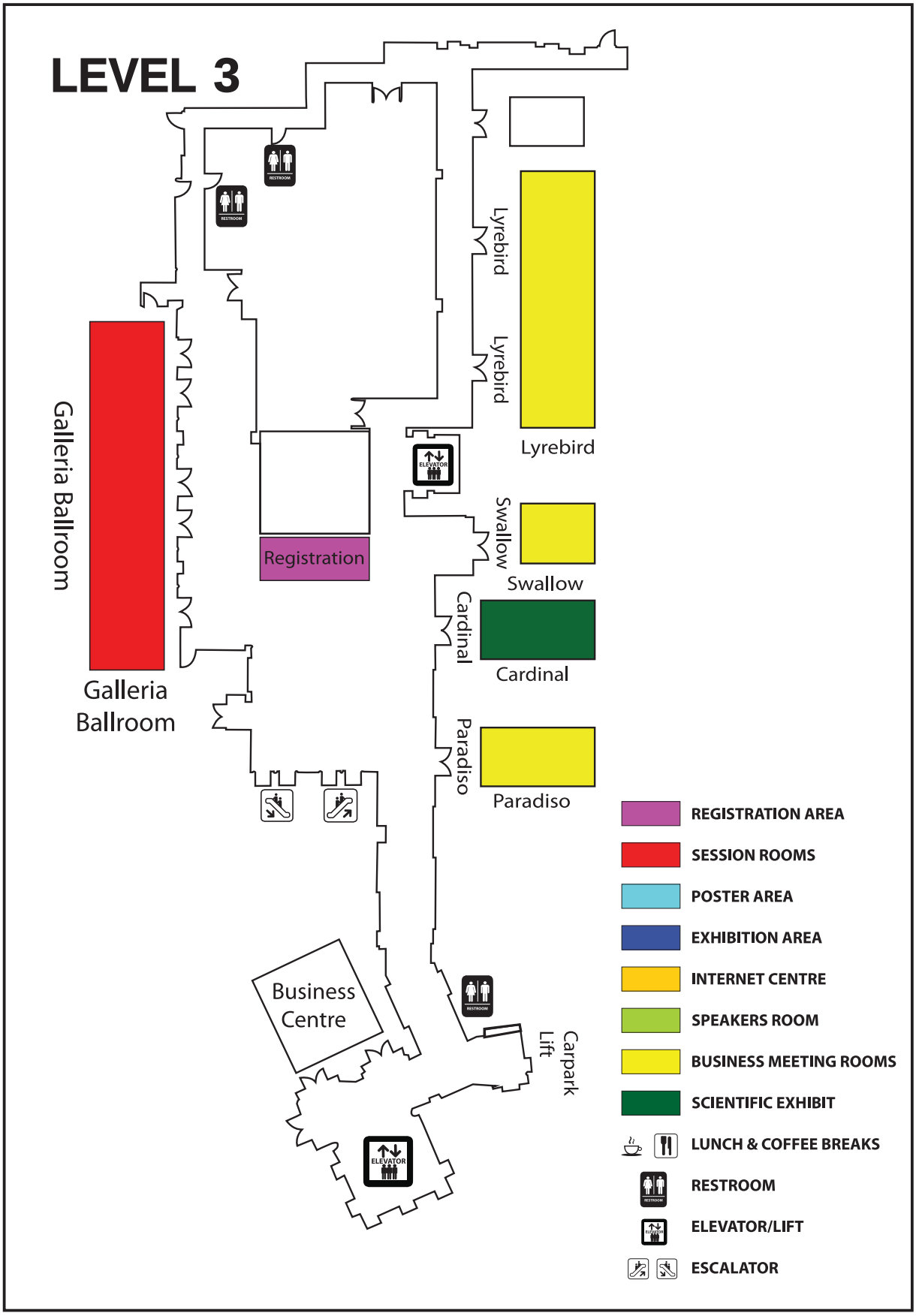
WIFI

There is free wifi in the venue for all registered delegates. In order to log-on, connect to the "waterfront" network and when you open your internet browser, the hotel's connectivity page prompter will appear for you to key in a username and password.
Username: aoec
Password: !aoec

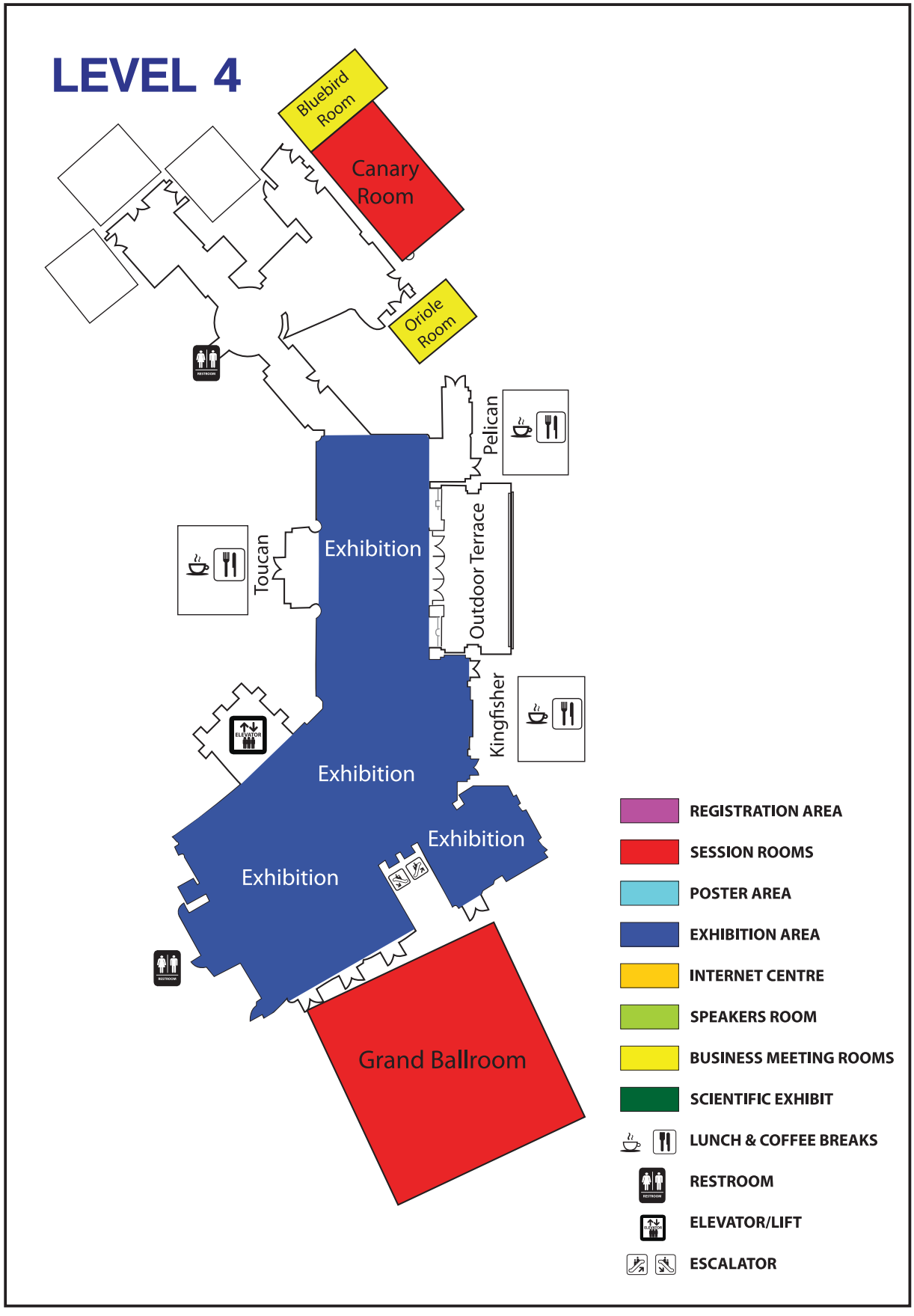
CONGRESS CENTRE FLOOR PLANS



CONGRESS CENTRE FLOOR PLANS



CONGRESS CENTRE FLOOR PLANS



PRACTICAL INFORMATION ON SINGAPORE

ABOUT SINGAPORE

Despite being one of the smallest countries in the world (with a land area of about 710 square kilometres), host city Singapore is rich in contrast and colour. A beautiful and cosmopolitan city, Singapore's skyline is dotted with high-rise buildings and landscape gardens, with the bay providing a beautiful backdrop. The city is populated by people with a diverse range of ethnicities, with many different languages, cultures and religions. Dining, along with shopping, is said to be the country's national past time and there are excellent restaurants to choose from, day or night, with options from Peranakan to Chinese, Indian to Malay, fusion and more.

CITY TRANSPORT

The Mass Rapid Transit (MRT) system is probably the fastest way to get around Singapore apart from taxis. Besides being one of the cleanest transport systems in the world, the MRT has great access to almost every part of Singapore.

SBS Transit is Singapore's major bus service operator. Services are all around Singapore.

A taxi is the most convenient way around. You should be able to hail a cab without any problems in most parts of Singapore.

ELECTRICITY

Electrical current is 230 volts, 50Hz. Three pin square plugs are used throughout Singapore.

TAXES

Most goods and services in Singapore are subject to a federal Goods and Services Tax (GST) of 7%. As a tourist in Singapore, you can claim a refund on the GST paid on your purchases made at participating retail shops when you leave Singapore and take your purchases home. Simply spend SGD$100 or more to qualify.

TIME ZONE

Singapore is 7 hours ahead of GMT in August.

TIPPING

Most of Singapore's hotels and restaurants include a 10 percent service charge in their bills. Even where such a charge is not automatically included, tipping is still optional.

WATER

Singapore's tap water is safe to drink without any further filtration or treatment and complies with the World Health Organisation drinking water guidelines.

GENERAL SCIENTIFIC INFORMATION

THE ASIAN AND OCEANIAN OUTSTANDING ACHIEVEMENT EPILEPSY AWARD

The Asian and Oceanian Achievement Epilepsy Award recognises and pays tribute to medical and non-medical professionals for their extraordinary contributions to epilepsy care in this region. The award is bestowed on John Walter DUNNE (Australia), Maria Felicidad A. SOTO (Philippines), Ming-Shung SU (Taiwan) and Qifu TAN (China) and will be given out during the Welcome Ceremony on Thursday.

THE OUTSTANDING PERSON WITH EPILEPSY AWARD

The Outstanding Person with Epilepsy Award (IBE) will be presented to 6 awardees during the Welcome Ceremony on Thursday. The award is bestowed on Shenaz HAVEIWALA (India), KOH Chin Khoon Calvin (Singapore), Serene Siew Yin LOW (Malaysia), Etsuji SHIMOKAWA (Japan), Jui-Hsien WANG (Taiwan) and Robert WIERZBICKI (Australia).

ASEPA EEG CERTIFICATION EXAMINATION PART I AND PART II

Both Part I and Part II ASEPA EEG Certification Examinations will take place during the 10th AOEC. For further details, please contact the registration desk.

ASEPA PRE-CONGRESS TEACHING COURSES

Two ASEPA Pre-congress teaching courses will take place on Thursday from 08:15-11:45; one is entitled “Structural and metabolic causes of epilepsies” and the second is “Advances in imaging techniques in epilepsy evaluation”.

Please note that a separate registration is required to attend either of these teaching courses; you may register for them at the on-site registration desk. The registration fee for congress delegates is US$20 and it is US$40 for non-congress delegates.

EPILEPSY & SOCIETY SYMPOSIUM

An exciting programme that will be of great interest to both individuals living with epilepsy and to staff from community organisations supporting people with epilepsy will take place on Saturday from 08:30-15:05 in the Galleria Ballroom on level 3 of the Grand Copthorne Waterfront Conference Centre. It will be followed by a mini-fair offering practical information to delegates which will take place in the Lyrebird Room on level 3 of the venue. This programme has been developed by local and regional committees of the International Bureau for Epilepsy (IBE).

Please note that a separate registration is required for this programme; please enquire at the onsite registration desk.

GENERAL SCIENTIFIC INFORMATION

ILAE/CAOA CHAPTER CONVENTION

The ILAE/CAOA Chapter Convention will take place on Thursday from 12:00-13:45 in the Canary Room on level 4 of the Grand Copthorne Waterfront Conference Centre for pre-invited members. Lunch will be served from 11:30. All those attending the Chapter Convention are kindly asked to pick up their registration badges for the 10th AOEC in advance of the meeting.

TADOKORO AWARD

In order to encourage young researchers in epileptology in the region, there will be best presentation prizes for both platform and poster presentations. Dr. TADOKORO (Japan) contributed generously to the activities of the ILAE Commission on Asian and Oceanian Affairs (CAOA).

The first and second prize for both platform and poster presentation are US$300 and US$200 respectively and the recipients will be announced on Sunday before the main session.

TRAVEL BURSARY AWARDS

The Travel Bursary Award scheme was established to assist delegates to attend the 10th AOEC. A particular emphasis was given to those coming from developing regions which are locally active in the field of epilepsy. A total of 45 Travel Bursary Awards were selected by the Scientific Advisory Committee; funding for these awards were provided by the International League Against Epilepsy (ILAE) and the International Bureau for Epilepsy (IBE) and the ILAE Commission on Asian and Oceanian Affairs (CAOA).

The 10th AOEC Travel Bursary recipients are:

SURNAME	FIRST NAME	COUNTRY
APHICHARTPHANKAWEE	Salinthip	Thailand
BAHRANI	Kunal	India
BAJPAI	Swati	India
BOJJA	Sree lalitha	India
CHAUDHARY	Nilesh	India
CHEN	Yong-Jun	China
DESAI	Soaham	India
DHIMAN	Vikas	India
FU-LI	Min	China
GANNE	Chaitanya	India
GOEL	Khushbu	India
JAGATHAN	Jitha	India
JAISWAL	Shyam	India
KARAN	Kalpita Rashmi	India
KEANGPRAPHUN	Thimpika	Thailand
KIM	Ju-seong	Korea

GENERAL SCIENTIFIC INFORMATION

SURNAME	FIRST NAME	COUNTRY
KUMAR	Ashok	India
KURWALE	Nilesh	India
LAW	Wan Chung	Malaysia
MAHARJAN	Promish	Nepal
MAHLI	Saima Mahmood	Pakistan
MANALAC	Anna Lizza	Philippines
MANDADIGE	Sanjaya	Sri Lanka
MANDAKH	Burentugs	Mongolia
MCMURTRIE	Yvette	Australia
MUKHERJEE	Somnath	India
MUNDLAMURI	Ravindranadh Chowdary	India
PALISOC	Maela	Philippines
PARAMESWARAN	Sajeesh	India
QIU	Guozhen	China
RAMACHANDRAN	Jaychandran	India
REDDY	K. Jayasankar	India
REN	Jiechuan	China
RUCHI	Baghel	India
SALAM	Abdus	Bangladesh
SARVA	Sailaja	India
SIMJEE	Shabana Usman	Pakistan
SUWANNACHOTE	Sirorat	Thailand
TELEW	Julie Christie	Indonesia
VELLINGIRI	Balachandar	India
VERMA	Mansi	India
WO	Monica Chen Mun	Malaysia
WU	Yuan	China
XIE	Han	China
ZAW	Swe Swe	Myanmar

SAVE THE DATE

www.epilepsyprague2016.org

SCIENTIFIC PROGRAMME

FULL PROGRAMME TIMETABLE

Thursday 7th August		Friday 8th August			
		ASEPA Didactic Lecture: BRAIN FUNCTIONAL ANATOMY AND EPILEPTIC NETWORKS - THE CONNECTION 07:30-08:15			Special Session: HOW TO GET YOUR PAPER PUBLISHED 07:45-08:45
ASEPA Teaching Course: STRUCTURAL AND METABOLIC CAUSES OF EPILEPSIES 08:15-11:45	ASEPA Teaching Course: ADVANCES IN IMAGING TECHNIQUES IN EPILEPSY EVALUATION 08:15-11:45	ASEPA Didactic Lecture: WHEN IS EPILEPSY PRESENT AND WHEN IS IT NOT? 08:15-09:00			
		Main Session: EPILEPSY BURDEN 09:00-10:30			
		Coffee Break: 10:30-11:00			
		Post Main Session: THE COST AND ECONOMIC BURDEN OF EPILEPSY	Parallel Sessions 11:00-12:30		
			MORTALITY IN EPILEPSY	LIVING WITH AED SIDE EFFECTS	EPILEPSY AND PSYCHIATRY
		Lunch & Posters 12:30-13:30			
		Eisai Satellite Symposium: A NEW POTENTIAL FOR POS: TARGETING POSTSYNAPTIC AMPA RECEPTORS 13:30-15:00			
Chairman's Symposium: AED TOLERANCE AND RESISTANCE 14:00-15:30		TOURNAMENT OF THE BRAINWAVES 15:00-16:00	Platform Session: AED ISSUES 15:00-16:00	Platform Session: SURGERY 15:00-16:00	GCAE Forum: REDUCING THE TREATMENT GAP IN ASIA 15:00-16:00
Masakazu Seino Memorial Lecture: RECENT ADVANCES IN MOLECULAR GENETICS OF EPILEPSY 15:30-16:15		Coffee Break: 16:00-16:30			
Sanofi Satellite Symposium: DEVELOPING ACCESS TO CARE FOR PEOPLE WITH EPILEPSY IN EMERGING COUNTRIES 16:30-18:00	Elekta Satellite Symposium: CLINICAL APPLICATION OF MAGNETOENCEPHA-LOGRAPHY (MEG) FOR REFRACTORY EPILEPSY 16:30-18:00	Video Quiz: PAROXYSMAL EVENTS IN ADULTS 16:30-17:30	Debate: MECHANISMS OF AEDS ARE NOT RELEVANT IN EPILEPSY TREATMENT 16:30-17:30	Platform Session: GENETICS AND POPULATIONS 16:30-17:30	GCAE Forum: REDUCING THE TREATMENT GAP IN ASIA 16:30-17:30
		UCB Satellite Symposium: CHOOSING THE RIGHT ANTIEPILEPTIC DRUG (AED) FOR THE LONG TERM MANAGEMENT OF EPILEPSY 17:30-19:00			
WELCOME CEREMONY 18:30-19:30					
WELCOME RECEPTION 19:30-20:30					

SCIENTIFIC PROGRAMME

FULL PROGRAMME TIMETABLE

<table>
<tr><th colspan="6">Saturday
9th August</th><th colspan="4">Sunday
10th August</th></tr>
<tr><td></td><td colspan="5">ASEPA Didactic Lecture:
EPILEPSY WITH PSYCHIATRIC DISORDERS - SAME DISEASE, DIFFERENT MANIFESTATIONS?
07:30-08:15</td><td></td></tr>
<tr><td></td><td colspan="5">ASEPA Didactic Lecture:
AN UPDATE IN CLASSIFICATION AND TREATMENT IN STATUS EPILEPTICUS
08:15-09:00</td><td colspan="3">ASEPA Didactic Lecture:
WHAT'S NEW IN AED-INDUCED SJS, TEN AND DRESS?
08:00-08:45
AWARDS CEREMONY
08:45-09:00</td></tr>
<tr><td rowspan="8">Epilepsy & Society Symposium
08:30-15:05</td><td colspan="5">Main Session:
NEURO-STIMULATION IN THE TREATMENT OF EPILEPSY
09:00-10:30</td><td colspan="3">Main Session:
ELECTROPHYSIOLOGICAL MARKERS OF THE EPILEPTOGENIC ZONE
09:00-10:30</td></tr>
<tr><td colspan="5">Coffee Break: 10:30-11:00</td><td colspan="3">Coffee Break: 10:30-11:00</td></tr>
<tr><td rowspan="2">Post Main Session:
EPILEPSY SURGERY IN ASIA
11:00-12:30</td><td colspan="4">Parallel Sessions 11:00-12:30</td><td rowspan="2">Post Main Session:
EEG REVISITED
11:00-12:30</td><td colspan="2">Parallel Sessions 11:00-12:30</td></tr>
<tr><td>SEIZURES AND EPILEPSY IN THE ELDERLY</td><td>PEDIATRIC EPILEPTOLOGY</td><td>GENERIC AEDS</td><td>SEIZURES AND EPILEPSY DUE TO INFECTION AND INFLAMMATION</td><td>PROSPECTIVE THERAPIES FOR EPILEPSY</td></tr>
<tr><td colspan="5">Lunch & Posters
12:30-13:30</td><td colspan="3" rowspan="4"></td></tr>
<tr><td colspan="5">GSK Satellite Symposium:
DIAGNOSIS AND TREATMENT OF PATIENTS WITH EPILEPSY:
WHAT'S NEW AND IS THERE ROOM FOR IMPROVEMENT?
13:30-15:00</td></tr>
<tr><td>Special Session:
THE NEW ILAE CLASSIFICATION OF SEIZURES AND EPILEPSIES – THE WAY FORWARD
15:00-16:00</td><td>Platform Session:
EPILEPTO-GENESIS AND BASIC SCIENCE
15:00-16:00</td><td>Platform Session:
SEIZURE DIAGNOSIS AND NEURO-PHYSIOLOGY
15:00-16:00</td><td>Platform Session:
PRESURGICAL EVALUATION AND SURGERY
15:00-16:00</td></tr>
<tr><td colspan="5">Coffee Break: 16:00-16:30</td></tr>
<tr><td>Video Quiz:
PAROXYSMAL EVENTS IN INFANTS, CHILDREN AND ADOLESCENTS
16:30-17:30</td><td>Debate:
EPILEPSY SURGERY FOR NON-LESIONAL EPILEPSY
16:30-17:30</td><td>Workshop:
SETTING UP AN EPILEPSY MONITORING UNIT: TIPS AND PITFALLS
16:30-17:30</td><td>Platform Session:
NEURO-PSYCHOLOGY AND SOCIAL
16:30-17:30</td><td>Platform Session:
OUTCOMES AND NEUROIMAGING
16:30-17:30</td></tr>
</table>

Final Programme

SCIENTIFIC PROGRAMME – THURSDAY 7TH AUGUST

Grand Ballroom (level 4)	Galleria Ballroom (level 3)	Cardinal Room (level 3)
	ASEPA Teaching Course: STRUCTURAL AND METABOLIC CAUSES OF EPILEPSIES 08:15-11:45	ASEPA Teaching Course: ADVANCES IN IMAGING TECHNIQUES IN EPILEPSY EVALUATION 08:15-11:45
The Chairman's Symposium: AED TOLERANCE AND RESISTANCE 14:00-15:30		
Masakazu Seino Memorial Lecture: RECENT ADVANCES IN MOLECULAR GENETICS OF EPILEPSY 15:30-16:15		
Sanofi Satellite Symposium: DEVELOPING ACCESS TO CARE FOR PEOPLE WITH EPILEPSY IN EMERGING COUNTRIES: ASIAN EXPERIENCES AND PERSPECTIVES 16:30-18:00	Elekta Satellite Symposium: CLINICAL APPLICATION OF MAGNETOENCEPHALOGRAPHY (MEG) FOR REFRACTORY EPILEPSY: ADVANCES IN FUNCTIONAL MAPPING AND LOCALIZATION OF THE EPILEPTOGENIC ZONE 16:30-18:00	
Welcome Ceremony 18:30-19:30		
Welcome Reception 19:30-20:30		

Final Programme

SCIENTIFIC PROGRAMME – THURSDAY 7TH AUGUST

08:15-11:45 ASEPA Teaching Course Galleria Ballroom, level 3

STRUCTURAL AND METABOLIC CAUSES OF EPILEPSIES
Chairs: Josephine GUTIERREZ (Philippines) and Siew-Ju SEE (Singapore)

Post-traumatic epilepsy
Chong-Tin TAN (Malaysia)

Post-stroke epilepsy
Ta-Cheng CHEN (Taiwan)

Post-encephalitic epilepsy
Usha Kant MISRA (India)

Brain tumour
Josephine GUTIERREZ (Philippines)

Mitochondrial disease
Yu-ichi GOTO (Japan)

Neurocutaneous syndrome
Ingrid SCHEFFER (Australia)

Malformations of cortical development
Athanasios COVANIS (Greece)

CNS vascular malformation
Howan LEUNG (Hong Kong)

SCIENTIFIC PROGRAMME – THURSDAY 7TH AUGUST

08:15-11:45 ASEPA Teaching Course — Cardinal Room, level 3

ADVANCES IN IMAGING TECHNIQUES IN EPILEPSY EVALUATION
Chairs: Graeme JACKSON (Australia) and Tchoyoson Choie Cheio LIM (Singapore)

Structural MRI: visual inspection versus automated assessment
Graeme JACKSON (Australia)

DWI and MRS
Tchoyoson Choie Cheio LIM (Singapore)

DTI tractography
Elysa WIDJAJA (Indonesia)

fMRI mapping of eloquent cortex
Winston Eng-Hoe LIM (Singapore)

SPECT and SISCOM
Terence O'BRIEN (Australia)

PET
Yotin CHINVARUN (Thailand)

MEG
Hiroshi OTSUBO (Japan)

Multimodal imaging for epilepsy surgery epileptogenic networks
Sarat CHANDRA (India)

14:00-15:30 Main Session — Grand Ballroom, level 4

THE CHAIRMAN'S SYMPOSIUM: AED TOLERANCE AND RESISTANCE
Chairs: Shih Hui LIM (Singapore) and Vinod SAXENA (India)

The definition and mechanism of AED tolerance and resistance
Emilio PERUCCA (Italy)

What's new in Drug Resistant Epilepsy (DRE)?
Patrick KWAN (Australia)

Can DRE be prevented?
Byung-In LEE (South Korea)

Pseudo-DRE
John DUNNE (Australia)

SCIENTIFIC PROGRAMME – THURSDAY 7TH AUGUST

15:30-16:15 The Masakazu Seino Memorial Lecture — Grand Ballroom, level 4

Chair: Chong-Tin TAN (Malaysia)

Recent advances in molecular genetics of epilepsy
Sam BERKOVIC (Australia)

16:30-18:00 Satellite Symposium: Sanofi — Grand Ballroom, level 4

DEVELOPING ACCESS TO CARE FOR PEOPLE WITH EPILEPSY IN EMERGING COUNTRIES: ASIAN EXPERIENCES AND PERSPECTIVES
Chairs: Chong-Tin TAN (Malaysia) and Pierre-Marie PREUX (France)

ILAE initiatives in Asia
Chong-Tin TAN (Malaysia)

Review of the "Initiatives" programme in Lao PDR: action-research to identify and follow-up people with epilepsy in 5 rural provinces
Phetvongsinh CHIVORAKOUN (Laos)

Outcomes of the "Prey Veng" programme in Cambodia: from a population-based study to a strategy to improve access to care
Devender BHALLA (India)

DHEVELOP and ECLAIR projects: leveraging learnings from Lao and Cambodia programmes
Farid BOUMEDIENE (France), Devender BHALLA (India), Phetvongsinh CHIVORAKOUN (Laos), Pierre-Marie PREUX (France)

Launching of Myanmar Epilepsy Initiative: experience and challenges
Win Min THIT (Myanmar)

16:30-18:00 Satellite Symposium: Elekta — Galleria Ballroom, level 3

CLINICAL APPLICATION OF MAGNETOENCEPHALOGRAPHY (MEG) FOR REFRACTORY EPILEPSY: ADVANCES IN FUNCTIONAL MAPPING AND LOCALIZATION OF THE EPILEPTOGENIC ZONE
Chair: Xavier DE TIÈGE (Belguim)

Magnetoencephalography: from theory to clinical applications
Xavier DE TIÈGE (Belgium)

Clinical experience of MEG in pre-surgical evaluation of epilepsy
Masaki IWASAKI (Japan)

Q & A

18:30-19:30 Welcome Ceremony — Grand Ballroom, level 4

Final Programme

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

Grand Ballroom (level 4)	Waterfront Ballroom (level 2)	Riverfront Ballroom (level 2)
ASEPA Didactic Lecture: BRAIN FUNCTIONAL ANATOMY AND EPILEPTIC NETWORKS - THE CONNECTION 07:30-08:15	Special Session: HOW TO GET PUBLISHED IN EPILEPSIA AND EPILEPTIC DISORDERS 07:45-08:45	
ASEPA Didactic Lecture: WHEN IS EPILEPSY PRESENT AND WHEN IS IT NOT? 08:15-09:00		
Main Session: EPILEPSY BURDEN 09:00-10:30		
Coffee Break		
Post Main Session: THE COST AND ECONOMIC BURDEN IN EPILEPSY 11:00-12:30	Parallel Session: MORTALITY IN EPILEPSY 11:00-12:30	Parallel Session: LIVING WITH AED SIDE EFFECTS 11:00-12:30
Lunch		
Eisai Satellite Symposium: A NEW POTENTIAL FOR POS: TARGETING POSTSYNAPTIC AMPA RECEPTORS 13:30-15:00		
THE TOURNAMENT OF THE BRAINWAVES 15:00-16:00	Platform Session: AED ISSUES 15:00-16:00	Platform Session: SURGERY 15:00-16:00
Coffee Break		
	Video Quiz: PAROXYSMAL EVENTS IN ADULTS 16:30-17:30	Debate: MECHANISMS OF AEDS ARE NOT RELEVANT IN THE TREATMENT OF EPILEPSY 16:30-17:30
UCB Satellite Symposium: CHOOSING THE RIGHT ANTIEPILEPTIC DRUG (AED) FOR THE LONG TERM MANAGEMENT OF EPILEPSY 17:30-19:00		

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

Galleria Ballroom (level 3)	Canary Room (level 4)	Veranda Rooms (level 2)
		POSTER SET-UP 08:00-09:00
		POSTERS ON DISPLAY 09:00-17:00
Coffee Break		
Parallel Session: EPILEPSY AND PSYCHIATRY 11:00-12:30		
Lunch		
GCAE Forum: REDUCING THE TREATMENT GAP IN ASIA 15:00-16:00		
Coffee Break		
GCAE Forum: REDUCING THE TREATMENT GAP IN ASIA 16:30-17:30	Platform Session: GENETICS AND POPULATIONS 16:30-17:30	

Final Programme

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

07:30-08:15 ASEPA Didactic Lecture — Grand Ballroom, level 4
Chair: Colin LUI (Hong Kong)

Brain functional anatomy and epileptic networks - the connection
Xingzhou LIU (China)

07:45-08:45 Special Session — Waterfront Ballroom, level 2

HOW TO GET PUBLISHED IN EPILEPSIA AND EPILEPTIC DISORDERS
Chair: Ingrid SCHEFFER (Australia)

Why publish in Epilepsia? New features to get your paper seen
Gary MATHERN (USA)

Epileptic Disorder's mission
Yushi INOUE (Japan)

How to get published in Epilepsia
Akio IKEDA (Japan)

08:15-09:00 ASEPA Didactic Lecture — Grand Ballroom, level 4
Chair: Kurnia Kusumastuti (Indonesia)

When is epilepsy present and when is it not?
Byung-In LEE (South Korea)

09:00-10:30 Main Session — Grand Ballroom, level 4

EPILEPSY BURDEN
Chairs: Athanasios COVANIS (Greece) and Jing-Jane TSAI (Taiwan)

The epidemiological burden
Wendyl D'SOUZA (Australia)

Neuro-cognitive burden
Sang-Ahm LEE (South Korea)

The psychosocial burden on patients
Yushi INOUE (Japan)

Reducing epilepsy burden; the role of IBE and its regional committees
Athanasios COVANIS (Greece)

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

11:00-12:30 Post Main Session Grand Ballroom, level 4

THE COST AND ECONOMIC BURDEN IN EPILEPSY
Chairs: Robert COLE (Australia) and Kheng-Seang LIM (Malaysia)

Methodological issues in estimating the cost of epilepsy
Zhiliang LIU (China)

Reducing the economic burden - lessons learnt from the west
Samuel WIEBE (Canada)

Reducing the economic burden of epilepsy in developing countries - what has been and what else can be done?
Kurupath RADHAKRISHNAN (India)

Epilepsy and employment
Kheng-Seang LIM (Malaysia)

11:00-12:30 Parallel Session Waterfront Ballroom, level 2

MORTALITY IN EPILEPSY
Chairs: Ernie SOMERVILLE (Australia) and Ding DING (China)

Long-term mortality in epilepsy
Ding DING (China)

Sudden Unexpected Death in Epilepsy (SUDEP) - An update
Rosey PANELLI (Australia)

Cause-specific mortality
Eugen TRINKA (Austria)

Accidental and drowning deaths in epilepsy
Ernie SOMERVILLE (Australia)

Final Programme

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

11:00-12:30 Parallel Session Riverfront Ballroom, level 2

LIVING WITH AED SIDE EFFECTS
Chairs: Frank VAJDA (Australia) and Sridharan RAMARATNAM (India)

Overview of AED side effects
Sridharan RAMARATNAM (India)

How to use AEDs during pregnancy and lactation
Frank VAJDA (Australia)

How to maintain bone health while on AEDs
Kanitpong PHABPHAL (Thailand)

How to minimise atherosclerosis with long-term AED usage
Yao-Chung CHUANG (Taiwan)

11:00-12:30 Parallel Session Galleria Ballroom, level 3

EPILEPSY AND PSYCHIATRY
Chairs: Sung-Pa PARK (South Korea) and Beng-Yeong NG (Singapore)

Psychotic illness in patients with epilepsy
Kousuke KANEMOTO (Japan)

Affective symptoms in patients with epilepsy
Sung-Pa PARK (South Korea)

The correlation between epilepsy and attention deficit hyperactivity disorder
I-Ching CHOU (Taiwan)

Psychiatric evaluation during AED treatment
Beng-Yeong NG (Singapore)

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

13:30-15:00 Satellite Symposium: Eisai — Grand Ballroom, level 4

A NEW POTENTIAL FOR POS: TARGETING POSTSYNAPTIC AMPA RECEPTORS
Chair: Yu-Li WU (Taiwan)

Burden of epilepsy: Do we need further options?
Shih Hui LIM (Singapore)

AMPA receptors - a new therapeutic target for partial seizures
Patrick KWAN (Australia)

Efficacy and safety of adjunctive perampanel for the treatment of refractory partial seizures: A pooled analysis of phase III studies and initial European experience
Eugen TRINKA (Austria)

Panel discussion
Yu-Li WU (Taiwan), Shih-Hui LIM (Singapore), Patrick KWAN (Australia) and Eugen TRINKA (Austria)

15:00-16:00 Quiz — Grand Ballroom, level 4

THE TOURNAMENT OF THE BRAINWAVES
Quiz Masters: Shih Hui LIM (Singapore) and Nigel TAN (Singapore)

15:00-17:30 GCAE Forum — Galleria Ballroom, level 3

REDUCING THE TREATMENT GAP IN ASIA
Chairs: Ernie SOMERVILLE (Australia) and Chong-Tin TAN (Malaysia)

ILAE's modus operandi
Emilio PERUCCA (Italy)

A decade of Global Campaign Against Epilepsy in China: what's next?
Shichuo LI (China)

Train-the-trainer programmes; can the success in the Philippines be implemented in other Asian countries?
Felicidad SOTO (Philippines)

Final Programme

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

Coffee Break

The Lao initiative on access to treatment for epilepsy
Somchit VORACHIT (Laos)

Reducing the treatment gap in India: an innovative approach
Mamta Bhushan SINGH (India)

An update on treatment gap projects in the region
Ernie SOMERVILLE (Australia)

15:00-16:00 Platform Session — Waterfront Ballroom, level 2

Refer to page 52

AED ISSUES
Chair: Man Mohan MEHNDIRATTA (India)

15:00-16:00 Platform Session — Riverfront Ballroom, level 2

Refer to page 52

SURGERY
Chair: Guoming LUAN (China)

16:30-17:30 Practical Session: Video Quiz — Waterfront Ballroom, level 2

PAROXYSMAL EVENTS IN ADULTS
Chairs: Shang-Yeong KWAN (Taiwan) and Weiping LIAO (China)

Presenters:
Sangeeta RAVAT (India)
Suryani GUNADHARMA (Indonesia)
Weiping LIAO (China)

16:30-17:30 Practical Session: Debate — Riverfront Ballroom, level 2

MECHANISMS OF AEDS ARE NOT RELEVANT IN THE TREATMENT OF EPILEPSY
Chair: Colin LUI (Hong Kong)

For
John DUNNE (Australia)

Against
P. SATISHCHANDRA (India)

SCIENTIFIC PROGRAMME – FRIDAY 8TH AUGUST

16:30-17:30 Platform Session Canary Room, level 4

Refer to page 53

GENETICS AND POPULATIONS
Chair: Patrick KWAN (Australia)

17:30-19:00 Satellite Symposium: UCB Grand Ballroom, level 4

CHOOSING THE RIGHT ANTIEPILEPTIC DRUG (AED) FOR THE LONG-TERM MANAGEMENT OF EPILEPSY
Chair: Byung- In LEE (South Korea)

Is it epilepsy? Using cutting edge technology to make a diagnosis
Akio IKEDA (Japan)

Impact of enzyme inducing AEDs on long-term outcomes in epilepsy patients
Wu Xun YI (China)

Managing issues with cognition in epilepsy
Ish ANAND (India)

A changing paradigm in the treatment of epilepsy? Advantages and disadvantages of newer versus older AEDs
Terence O'BRIEN (Australia)

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

Grand Ballroom (level 4)	Waterfront Ballroom (level 2)	Riverfront Ballroom (level 2)
ASEPA Didactic Lecture: EPILEPSY WITH PSYCHIATRIC DISORDERS- SAME DISEASE DIFFERENT MANIFESTATIONS? 07:30-08:15		
ASEPA Didactic Lecture: AN UPDATE IN CLASSIFICATION AND TREATMENT IN STATUS EPILEPTICUS 08:15-09:00		
Main Session: NEURO-STIMULATION IN THE TREATMENT OF EPILEPSY 09:00-10:30		
Coffee Break		
Post Main Session: EPILEPSY SURGERY IN ASIA: DEVELOPMENTS, UTILIZATION AND BARRIERS TO OVERSOME 11:00-12:30	Parallel Session: SEIZURES AND EPILEPSY IN THE ELDERLY 11:00-12:30	Parallel Session: PEDIATRIC EPILEPTOLOGY 11:00-12:30
Lunch		
GSK Asia Satellite Symposium: DIAGNOSIS AND TREATMENT OF PATIENTS WITH EPILEPSY: WHAT'S NEW AND IS THERE ROOM FOR IMPROVEMENT? 13:30-15:00		
Special Session: THE NEW ILAE CLASSIFICATION OF SEIZURES AND EPILEPSIES 15:00-16:00	Platform Session: EPILEPTOGENESIS AND BASIC SCIENCE 15:00-16:00	Platform Session: SEIZURE DIAGNOSIS AND NEUROPHYSIOLOGY 15:00-16:00
Coffee Break		
Video Quiz: PAROXYSMAL EVENTS IN INFANTS, CHILDREN AND ADOLESCENTS 16:30-17:30	Debate: EPILEPSY SURGERY FOR NON-LESIONAL EPILEPSY 16:30-17:30	Workshop: SETTING UP AN EPILEPSY MONITORING UNIT: TIPS AND PITFALLS 16:30-17:30

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

Canary Room (level 4)	Galleria Ballroom (level 3)	Veranda Rooms (level 2)
	Epilepsy & Society Symposium: OPENING ADDRESS AND PRIZE GIVING BE AED SMART! COMPLIANCE AND CONSIDERATIONS 08:30-10:30	POSTERS ON DISPLAY 09:00-17:00
Coffee Break		
Parallel Session: GENERIC AEDS 11:00-12:30	Epilepsy & Society Symposium: LIVING WITH EPILEPSY: SCHOOL, SPORT AND WORK 11:00-12:30	
Lunch		
	Epilepsy & Society Symposium: NON MEDICATION THERAPIES AND SOLUTIONS IN EPILEPSY CLOSING COMMENTS 13:30-15:05	
Platform Session PRESURGICAL EVALUATION AND SURGERY 15:00-16:00		
Coffee Break		
Platform Session: NEUROPSYCHOLOGY AND SOCIAL 16:30-17:30	Platform Session: OUTCOMES AND NEUROIMAGING 16:30-17:30	POSTER REMOVAL 17:00-18:00

Final Programme

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

07:30-08:15 ASEPA Didactic Lecture — Grand Ballroom, level 4
Chair: Ranjanie GAMAGE (Sri Lanka)

Epilepsy with psychiatric disorders - same disease, different manifestations?
Yushi INOUE (Japan)

08:15-09:00 ASEPA Didactic Lecture — Grand Ballroom, level 4
Chair: Muzharul MANNAN (Bangladesh)

An update in classification and treatment in status epilepticus
Eugen TRINKA (Austria)

09:00-10:30 Main Session — Grand Ballroom, level 4

NEURO-STIMULATION IN THE TREATMENT OF EPILEPSY
Chairs: Mark COOK (Australia) and Eun-Ik SON (South Korea)

Brain stimulation - state of the art in 2014
Mark COOK (Australia)

Cranial nerve stimulation
Christopher De GIORGIO (USA)

Trans-cranial magnetic stimulation
Yuping WANG (China)

Deep brain stimulation
Young-Min SHON (South Korea)

11:00-12:30 Post Main Session — Grand Ballroom, level 4

EPILEPSY SURGERY IN ASIA: DEVELOPMENTS, UTILIZATION AND BARRIERS TO OVERCOME
Chairs: Gary MATHERN (USA) and Taisuke OTSUKI (Japan)

Identification of epilepsy surgery treatment gaps
Gary MATHERN (USA)

Build-up of "Epilepsy Care Network" in Japan
Taisuke OTSUKI (Japan)

Development of the Epilepsy Surgery Programme in China
Guoming LUAN (China)

Teleconferencing in the selection of epilepsy surgery candidates in Asia
Syed Ather ENAM (Pakistan)

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

11:00-12:30 Parallel Session Waterfront Ballroom, level 2

SEIZURES AND EPILEPSY IN THE ELDERLY
Chairs: Kanitpong PHABPHAL (Thailand) and Nick LAWN (Australia)

The first seizure in the older patient; clinical features and prognosis
Nick LAWN (Australia)

AED pharmacokinetics, drug interactions and choices
Ilo LEPPIK (USA)

Treatment responses in new-onset epilepsy in the elderly
Naoki AKAMATSU (Japan)

New-onset status epilepticus and cluster seizures in the elderly
Sanjib SINHA (India)

11:00-12:30 Parallel Session Riverfront Ballroom, level 2

PEDIATRIC EPILEPTOLOGY
Chairs: Heung-Dong KIM (South Korea) and Helen CROSS (United Kingdom)

Freedom from epilepsy in age-dependent epilepsy syndromes: cure or remission?
Helen CROSS (United Kingdom)

Interneuronopathies and genetics of the epileptic encephalopathies
Mitsuhiro KATO (Japan)

The developmental impact of epilepsy
Heung-Dong KIM (South Korea)

Genetic analysis in the pediatric epilepsy clinic – present and future
Ingrid SCHEFFER (Australia)

Final Programme

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

11:00-12:30 Parallel Session Canary Room, level 4

GENERIC AEDS
Chairs: Man Mohan MEHNDIRATTA (India) and Leonor CABRAL-LIM (Philippines)

Generic and brand AEDs; are they really equal?
Jing-Jane TSAI (Taiwan)

The legal and economic impact of using generic AEDs
Roy G. BERAN (Australia)

Switching AEDs: between brand and generic, and between generic and generic
Man Mohan MEHNDIRATTA (India)

Generic AEDs in the Asian market: the present and the future
Leonor CABRAL-LIM (Philippines)

13:30-15:00 Satellite Symposium: GlaxoSmithKline Grand Ballroom, level 4

DIAGNOSIS AND TREATMENT OF PATIENTS WITH EPILEPSY: WHAT'S NEW AND IS THERE ROOM FOR IMPROVEMENT?
Chair: Selim BENBADIS (USA)

Diagnosis, differential diagnosis, and misdiagnosis of seizures: room for improvement?
Selim BENBADIS (USA)

Pharmacological considerations when treating patients with epilepsy – what's new?
Patrick KWAN (Australia)

Everyday management of patients with epilepsy – what's new?
David LABINER (USA)

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

15:00-16:00 Special Session — Grand Ballroom, level 4

THE NEW ILAE CLASSIFICATION OF SEIZURES AND EPILEPSIES – THE WAY FORWARD
Chair: Emilio PERUCCA (Italy)

From Commission proposals to community-endorsed position papers: Procedures and implications
Sam WIEBE (Canada)

The new classification of seizures and epilepsies: History and evolution
Helen CROSS (United Kingdom)

Addressing the critical issues emerged from public consultation
Ingrid SCHEFFER (Australia)

Interactive discussion

15:00-16:00 Platform Session — Waterfront Ballroom, level 2

Refer to page 54

EPILEPTOGENESIS AND BASIC SCIENCE
Chair: Weiping LIAO (China)

15:00-16:00 Platform Session — Canary Room, level 4

Refer to page 54

PRESURGICAL EVALUATION AND SURGERY
Chair: Jing-Jane TSAI (Taiwan)

15:00-16:00 Platform Session — Riverfront Ballroom, level 2

Refer to page 55

SEIZURE DIAGNOSIS AND NEUROPHYSIOLOGY
Chair: Ernie SOMERVILLE (Australia)

16:30-17:30 Practical Session: Video Quiz — Grand Ballroom, level 4

PAROXYSMAL EVENTS IN INFANTS, CHILDREN AND ADOLESCENTS
Chairs: Anannit Visudtibhan (Thailand) and Hian-Tat ONG (Singapore)

Presenters:
Hian-Tat ONG (Singapore)
Surachai LIKASITWATTANAKUL (Thailand)
Lai-Choo ONG (Malaysia)

SCIENTIFIC PROGRAMME – SATURDAY 9TH AUGUST

16:30-17:30 Practical Session: Debate — Waterfront Ballroom, level 2

EPILEPSY SURGERY FOR NON-LESIONAL EPILEPSY
Chair: Andrew PAN (Singapore)

Do not waste time and financial resources in evaluating these patients for surgery
Andrew BLEASEL (Australia)

Patients must be evaluated extensively before giving up on surgery
Tatsuya TANAKA (Japan)

16:30-17:30 Practical Session: Workshop — Riverfront Ballroom, level 2

SETTING UP AN EPILEPSY MONITORING UNIT: TIPS AND PITFALLS
Chairs: Yotin CHINVARUN (Thailand) and Riki MATSUMOTO (Japan)

Choosing a video-EEG monitoring system
Yotin CHINVARUN (Thailand)

Achieving and maintaining technical standards in long-term EEG and video recordings
Shang-Yeong Kwan (Taiwan)

Reducing morbidity and mortality in the Epilepsy Monitoring Unit
Riki MATSUMOTO (Japan)

16:30-17:30 Platform Session — Canary Room, level 4

Refer to page 55

NEUROPSYCHOLOGY AND SOCIAL
Chair: Kheng-Seang LIM (Malaysia)

16:30-17:30 Platform Session — Galleria Ballroom, level 3

Refer to page 56

OUTCOMES AND NEUROIMAGING
Chair: Wendyl D'SOUZA (Australia)

EPILEPSY & SOCIETY SYMPOSIUM PROGRAMME - SATURDAY 9TH AUGUST

08:30-15:05	Epilepsy & Society Symposium	Galleria Ballroom, level 3

08:30-08:45 **OPENING ADDRESS**
Athanasios COVANIS (Greece)

08:45-09:00 **PRIZE GIVING TO OUTSTANDING PEOPLE WITH EPILEPSY (PWE) FROM COUNTRIES AROUND THE REGION**

09:00-10:30 **BE AED SMART! COMPLIANCE AND CONSIDERATIONS**
Chairs: Denise CHAPMAN (Australia) and Vinod SAXENA (India)

Anticonvulsants - why take them and how?
Speaker TBA

Non-compliance and epilepsy-related injury, death and SUDEP
Rosey PANELLI (Australia)

AEDs and bone health / pregnancy
Frank VAJDA (Australia)

Getting and taking medicine - the patient's perspective
Speaker TBA

11:00-12:30 **LIVING WITH EPILEPSY: SCHOOL, SPORT AND WORK**
Chairs: Robert COLE (Australia) and Ding DING (China)

Epilepsy and employment - to tell or not to tell?
Kheng-Seang LIM (Malaysia)

Stigma and epilepsy
Ding DING (China)

Sports and epilepsy
Michael LIM (Singapore)

School and epilepsy
Robert COLE (Australia)

Coping with epilepsy - an adult's perspective
Speaker TBA

EPILEPSY & SOCIETY SYMPOSIUM PROGRAMME - SATURDAY 9TH AUGUST

13:30-15:00 **NON MEDICATION THERAPIES AND SOLUTIONS IN EPILEPSY**
Chairs: John DUNNE (Australia) and Man Mohan MEHNDIRATTA (India)

Reflexology
Manjari TRIPATHI (India)

Stem cell therapy
Hoon Chul KANG (South Korea)

Brain stimulation to treat epilepsy
Christopher De GIORGIO (USA)

Taking care of the person with epilepsy - a caregiver's perspective
Speaker TBA

15:00-15:05 **CLOSING COMMENTS**
Derrick CHAN (Singapore)

15:05-17:00 Mini Fair Lyrebird Room, level 3

SCIENTIFIC PROGRAMME – SUNDAY 10TH AUGUST

Waterfront Ballroom (level 2)	Waterfront Ballroom II & III (level 2)	Riverfront Ballroom (level 2)
ASEPA Didactic Lecture: WHAT'S NEWS IN AED-INDUCED SJS, TEN AND DRESS 08:00-08:45		
Award Ceremony 08:45-09:00		
Main Session: ELECTROPHYSIOLOGICAL MARKERS OF THE EPILEPTOGENIC ZONE 09:00-10:30		
Coffee Break		
Waterfront Ballroom I (level 2)		
Post Main Session: EGG REVISITED 11:00-12:30	Parallel Session: SEIZURES AND EPILEPSY DUE TO INFECTION AND INFLAMMATION 11:00-12:30	Parallel Session: PROSPECTIVE THERAPIES FOR EPILEPSY 11:00-12:30

Final Programme

SCIENTIFIC PROGRAMME – SUNDAY 10TH AUGUST

08:00-08:45 ASEPA Didactic Lecture — Waterfront Ballroom, level 2

Chair: Nyan TUN (Myanmar)

What's new in AED-induced SJS, TEN and DRESS?
Wen-Hung CHUNG (Taiwan)

08:45-09:00 Awards Ceremony — Waterfront Ballroom, level 2

09:00-10:30 Main Session — Waterfront Ballroom, level 2

ELECTROPHYSIOLOGICAL MARKERS OF THE EPILEPTOGENIC ZONE
Chairs: Akio IKEDA (Japan) and Seung Bong HONG (South Korea)

The past and current role of scalp EEG in defining epileptogenic zones
Derrick CHAN (Singapore)

High frequency oscillation in neocortical epilepsy
Seung Bong HONG (South Korea)

Dense Array EEG source estimation in focal epilepsy
Madoka YAMAZAKI (Japan)

Future electrophysiological approaches in defining the epileptogenic zone
Akio IKEDA (Japan)

11:00-12:30 Post Main Session — Waterfront Ballroom I, level 2

EEG REVISITED
Chairs: Tayard DESUDCHIT (Thailand) and Sanjeev THOMAS (India)

Source localization of epileptiform activities
Sanjeev THOMAS (India)

EEG-fMRI
Dong ZHOU (China)

Detecting seizures in critical care
Tayard DESUDCHIT (Thailand)

SCIENTIFIC PROGRAMME – SUNDAY 10TH AUGUST

11:00-12:30 Parallel Session Waterfront Ballroom II & III, level 2

SEIZURES AND EPILEPSY DUE TO INFECTION AND INFLAMMATION
Chairs: Simon HARVEY (Australia) and Gagandeep SINGH (India)

Autoimmune epilepsy: clinical characteristics, biomarkers and therapy
Russell DALE (Australia)

Febrile Infection-Related Epilepsy Syndrome (FIRES)
Simon HARVEY (Australia)

Chronic epilepsy associated with CNS infections: a review of epidemiological evidence
Gagandeep SINGH (India)

11:00-12:30 Parallel Session Riverfront Ballroom, level 2

PROSPECTIVE THERAPIES FOR EPILEPSY
Chairs: Manjari TRIPATHI (India) and John DUNNE (Australia)

New AEDs
Terence O'BRIEN (Australia)

Reflexology
Manjari TRIPATHI (India)

Stem cell therapy
Hoon-Chul KANG (South Korea)

Individualized medicine based upon genetic information
Sunao KANEKO (Japan)

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NAME	DATE	TIME	SESSION TYPE	ROOM	ROLE
AFAWI, Z (Isreal)	8th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
AFIF, A (France)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
AKAMATSU, N (Japan)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
ANAND, I (India)	8th Aug	17:30-19:00	Satellite Symposium	Grand Ballroom	Speaker
BENBADIS, S (USA)	9th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Chair
BENBADIS, S (USA)	9th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
BERAN, R (Australia)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Speaker
BERKOVIC, S (Australia)	7th Aug	15:30-16:15	Masakazu Seino Memorial Lecture	Grand Ballroom	Speaker
BHALLA, D (India)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Speaker
BLEASEL, A (Australia)	9th Aug	16:30-17:30	Debate	Waterfront Ballroom	Debator
BOUMEDIENE, F (France)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Speaker
CABRAL-LIM, L (Philippines)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Speaker
CABRAL-LIM, L (Philippines)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Chair
CHAN, D (Singapore)	9th Aug	15:00-15:15	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
CHAN, D (Singapore)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Speaker
CHANDRA, S (India)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
CHAPMAN, D (Australia)	9th Aug	09:00-10:30	Epilepsy & Society Symposium	Galleria Ballroom	Chair
CHEN, T-C (Taiwan)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
CHEN, Y (China)	8th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
CHINVARUN, Y (Thailand)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
CHINVARUN, Y (Thailand)	9th Aug	16:30-17:30	Workshop	Riverfront Ballroom	Chair
CHINVARUN, Y (Thailand)	9th Aug	16:30-17:30	Workshop	Riverfront Ballroom	Speaker
CHIVORAKOUN, P (Laos)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Speaker
CHOU,I-C (Taiwan)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Speaker
CHUANG, Y-C (Taiwan)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
CHUNG, W-H (Taiwan)	10th Aug	08:00-08:45	ASEPA Didactic Lecture	Waterfront Ballroom	Speaker
COLE, R (Australia)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Chair
COLE, R (Australia)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Chair
COLE, R (Australia)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
COOK, M (Australia)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Chair
COOK, M (Australia)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
COVANIS, A (Greece)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
COVANIS, A (Greece)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Chair
COVANIS, A (Greece)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
COVANIS, A (Greece)	9th Aug	08:30-09:00	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
CROSS, H (United Kingdom)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
CROSS, H (United Kingdom)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
CROSS, H (United Kingdom)	9th Aug	15:00-16:00	Special Session	Grand Ballroom	Speaker
DALE, R (Australia)	10th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom 2 & 3	Speaker
DE TIEGE, X (Belgium)	7th Aug	16:30-18:00	Satellite Symposium	Galleria Ballroom	Chair
DE TIEGE, X (Belgium)	7th Aug	16:30-18:00	Satellite Symposium	Galleria Ballroom	Speaker
DeGIORGIO, C (USA)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
DeGIORGIO, C (USA)	9th Aug	13:30-15:00	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
DESAI, SD (India)	9th Aug	15:00-16:00	Platform Session	Canary Room	Speaker
DESUDCHIT, T (Thailand)	10th Aug	11:00-12:30	Post Main Session	Waterfront Ballroom 1	Chair
DESUDCHIT, T (Thailand)	10th Aug	11:00-12:30	Post Main Session	Waterfront Ballroom 1	Speaker
DING, D (China)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Chair
DING, D (China)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
DING, D (China)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Chair
DING, D (China)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
DING, J (China)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
D'SOUZA, W (Australia)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
D'SOUZA, W (Australia)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Chair

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NAME	DATE	TIME	SESSION TYPE	ROOM	ROLE
DUNNE, J (Australia)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Speaker
DUNNE, J (Australia)	8th Aug	16:30-17:30	Debate	Riverfront Ballroom	Debator
DUNNE, J (Australia)	9th Aug	13:30-15:00	Epilepsy & Society Symposium	Galleria Ballroom	Chair
DUNNE, J (Australia)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
ENAM, A (Pakistan)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
GAMAGE, R (Sri Lanka)	9th Aug	07:30-08:15	ASEPA Didactic Lecture	Grand Ballroom	Chair
GOTO, Y (Japan)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
GUNADHARMA, S (Indonesia)	8th Aug	16:30-17:30	Video Quiz	Waterfront Ballroom	Presenter
GUTIERREZ, J (Philippines)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Chair
GUTIERREZ, J (Philippines)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
HARVEY, S (Australia)	10th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom 2 & 3	Chair
HARVEY, S (Australia)	10th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom 2 & 3	Speaker
HONG, S-B (South Korea)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
HONG, S-B (South Korea)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Chair
HONG, S-B (South Korea)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Speaker
HUR, YJ (South Korea)	9th Aug	15:00-16:00	Platform Session	Canary Room	Speaker
IKEDA, A (Japan)	8th Aug	07:45-08:45	Special Session	Waterfront Ballroom	Speaker
IKEDA, A (Japan)	8th Aug	17:30-19:00	Satellite Symposium	Grand Ballroom	Speaker
IKEDA, A (Japan)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Chair
IKEDA, A (Japan)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Speaker
INOUE, Y (Japan)	8th Aug	07:45-08:45	Special Session	Waterfront Ballroom	Speaker
INOUE, Y (Japan)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
INOUE, Y (Japan)	9th Aug	07:30-08:15	ASEPA Didactic Lecture	Grand Ballroom	Speaker
IWASAKI, M (Japan)	7th Aug	16:30-18:00	Satellite Symposium	Galleria Ballroom	Speaker
JACKSON, G (Australia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Chair
JACKSON, G (Australia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
JITHA, J (India)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Speaker
KANEKO, S (Japan)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
KANEMOTO, K (Japan)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Speaker
KANG, H-C (South Korea)	9th Aug	13:30-15:00	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
KANG, H-C (South Korea)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
KASHIDA, Y (Japan)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
KATO, M (Japan)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
KIM, D-S (South Korea)	8th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
KIM, H-D (South Korea)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
KIM, H-D (South Korea)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
KIM, J-S (South Korea)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
KIM, SE (South Korea)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Speaker
KULKARNI, C (India)	9th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
KUSUMASTUTI, K (Indonesia)	8th Aug	08:15-09:00	ASEPA Didactic Lecture	Grand Ballroom	Chair
KWAN, P (Australia)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Speaker
KWAN, P (Australia)	8th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
KWAN, P (Australia)	8th Aug	16:30-17:30	Platform Session	Canary Room	Chair
KWAN, P (Australia)	9th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
KWAN, S-Y (Taiwan)	8th Aug	16:30-17:30	Video Quiz	Waterfront Ballroom	Chair
KWAN, S-Y (Taiwan)	9th Aug	16:30-17:30	Workshop	Riverfront Ballroom	Speaker
KWONG, LK (Hong Kong)	9th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
LABINER, D (USA)	9th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
LAWN, N (Australia)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Chair
LAWN, N (Australia)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
LEE, B-I (South Korea)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Speaker
LEE, B-I (South Korea)	8th Aug	08:15-09:00	ASEPA Didactic Lecture	Grand Ballroom	Speaker
LEE, B-I (South Korea)	8th Aug	17:30-19:00	Satellite Symposium	Grand Ballroom	Chair

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LEE, S-A (South Korea)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
LEE, SK (South Korea)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
LEPPIK, I (USA)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
LEUNG, H (Hong Kong)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
LI, J-M (China)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
LI, S (China)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
LIAO, W (China)	8th Aug	16:30-17:30	Video Quiz	Waterfront Ballroom	Chair
LIAO, W (China)	8th Aug	16:30-17:30	Video Quiz	Waterfront Ballroom	Presenter
LIAO, W (China)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Chair
LIKASITWATTANAKUL, S (Thailand)	9th Aug	16:30-17:30	Video Quiz	Grand Ballroom	Presenter
LIM, K-S (Malaysia)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Chair
LIM, K-S (Malaysia)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
LIM, K-S (Malaysia)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
LIM, K-S (Malaysia)	9th Aug	16:30-17:30	Platform Session	Canary Room	Chair
LIM, M (Singapore)	9th Aug	11:00-12:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
LIM, SH (Singapore)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Chair
LIM, SH (Singapore)	8th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
LIM, SH (Singapore)	8th Aug	15:00-16:00	Tournament Of The Brainwaves	Grand Ballroom	Chair
LIM, TCC (Singapore)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Chair
LIM, TCC (Singapore)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
LIM, WE-H (Singapore)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
LIN, W (China)	8th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
LIU, C (China)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
LIU, L-J (China)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
LIU, X (China)	8th Aug	07:30-08:15	ASEPA Didactic Lecture	Grand Ballroom	Speaker
LIU, Z (China)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
LOBJANIDZE, N (Georgia)	9th Aug	15:00-16:00	Platform Session	Canary Room	Speaker
LUAN, G (China)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Chair
LUAN, G (China)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
LUI, C (Hong Kong)	8th Aug	07:30-08:15	ASEPA Didactic Lecture	Grand Ballroom	Chair
LUI, C (Hong Kong)	8th Aug	16:30-17:30	Debate	Riverfront Ballroom	Chair
MAHMOUD, A (Saudi Arabia)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
MANALAC, ALS (Philippines)	9th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
MANNAN, M (Bangladesh)	9th Aug	08:15-09:00	ASEPA Didactic Lecture	Grand Ballroom	Chair
MATHERN, G (USA)	8th Aug	07:45-08:45	Special Session	Waterfront Ballroom	Speaker
MATHERN, G (USA)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Chair
MATHERN, G (USA)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
MATSUMOTO, R (Japan)	9th Aug	16:30-17:30	Workshop	Riverfront Ballroom	Chair
MATSUMOTO, R (Japan)	9th Aug	16:30-17:30	Workshop	Riverfront Ballroom	Speaker
MCINTOSH, AM (Australia)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Speaker
MEHNDIRATTA, MM (India)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Chair
MEHNDIRATTA, MM (India)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Chair
MEHNDIRATTA, MM (India)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Speaker
MEHNDIRATTA, MM (India)	9th Aug	13:30-15:00	Epilepsy & Society Symposium	Galleria Ballroom	Chair
MIN, F-L (China)	8th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
MISRA, UK (India)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
MUNDLAMURI, RC (India)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
NAKAJIMA, M (Canada)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
NAKAJIMA, M (Japan)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
NALINI, A (India)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Speaker
NG, B-Y (Singapore)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Chair
NG, B-Y (Singapore)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Speaker
O'BRIEN, T (Australia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker

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NAME	DATE	TIME	SESSION TYPE	ROOM	ROLE
O'BRIEN, T (Australia)	8th Aug	17:30-19:00	Satellite Symposium	Grand Ballroom	Speaker
O'BRIEN, T (Australia)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
ONG, H-T (Singapore)	9th Aug	16:30-17:30	Video Quiz	Grand Ballroom	Chair
ONG, H-T (Singapore)	9th Aug	16:30-17:30	Video Quiz	Grand Ballroom	Presenter
ONG, L-C (Malaysia)	9th Aug	16:30-17:30	Video Quiz	Grand Ballroom	Presenter
OTSUBO, H (Japan)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
OTSUKI, O (Japan)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Chair
OTSUKI, O (Japan)	9th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
PAN, A (Singapore)	9th Aug	16:30-17:30	Debate	Waterfront Ballroom	Chair
PANELLI, R (Australia)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
PANELLI, R (Australia)	9th Aug	09:00-10:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
PARK, S-P (South Korea)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Chair
PARK, S-P (South Korea)	8th Aug	11:00-12:30	Parallel Session	Galleria Ballroom	Speaker
PATTERSON, V (United Kingdom)	9th Aug	15:00-16:00	Platform Session	Canary Room	Speaker
PERUCCA, E (Italy)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Speaker
PERUCCA, E (Italy)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
PERUCCA, E (Italy)	9th Aug	15:00-16:00	Special Session	Grand Ballroom	Chair
PHABPHAL, K (Thailand)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
PHABPHAL, K (Thailand)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Chair
PILLAY, N (Canada)	9th Aug	16:30-17:30	Platform Session	Galleria Ballroom	Speaker
PREUX, P-M (France	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Chair
RADHAKRISHNAN, K (India)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
RAMARATNAM, S (India)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
RAMARATNAM, S (India)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
RAVAT, S (India)	8th Aug	16:30-17:30	Video Quiz	Waterfront Ballroom	Presenter
SATISHCHANDRA, P (India)	8th Aug	16:30-17:30	Debate	Riverfront Ballroom	Debator
SAW, J (Australia)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
SAXENA, V (India)	7th Aug	14:00-15:30	Chairman's Symposium	Grand Ballroom	Chair
SAXENA, V (India)	9th Aug	09:00-10:30	Epilepsy & Society Symposium	Galleria Ballroom	Chair
SCHEFFER, I (Australia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
SCHEFFER, I (Australia)	8th Aug	07:45-08:45	Special Session	Waterfront Ballroom	Chair
SCHEFFER, I (Australia)	9th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
SCHEFFER, I (Australia)	9th Aug	15:00-16:00	Special Session	Grand Ballroom	Speaker
SEE, S-J (Singapore)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Chair
SHARMA, D (India)	9th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
SHIN, J-W (South Korea)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
SHON, Y-M (South Korea)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
SINGH, G (India)	10th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom 2 & 3	Chair
SINGH, G (India)	10th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom 2 & 3	Speaker
SINGH, MB (India)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
SINHA, S (India)	9th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
SITNIKOV, A (Russian Federation)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
SOMERVILLE, E (Australia)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Chair
SOMERVILLE, E (Australia)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
SOMERVILLE, E (Australia)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Chair
SOMERVILLE, E (Australia)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
SOMERVILLE, E (Australia)	9th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Chair
SON, E-I (South Korea)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Chair
SOTO, F (Philippines)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
SUGANO, H (Japan)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
TAN, C-T (Malaysia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Galleria Ballroom	Speaker
TAN, C-T (Malaysia)	7th Aug	15:30-16:15	Masakazu Seino Memorial Lecture	Grand Ballroom	Chair
TAN, C-T (Malaysia)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Chair

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NAME	DATE	TIME	SESSION TYPE	ROOM	ROLE
TAN, C-T (Malaysia)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Speaker
TAN, C-T (Malaysia)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Chair
TAN, EMJ (Singapore)	9th Aug	15:00-16:00	Platform Session	Canary Room	Speaker
TAN, N (Singapore)	8th Aug	15:00-16:00	Tournament Of The Brainwaves	Grand Ballroom	Chair
TANAKA, T (Japan)	9th Aug	16:30-17:30	Debate	Waterfront Ballroom	Debator
THAMPRATANKUL, L (Thailand)	9th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
THIT, WM (Myanmar)	7th Aug	16:30-18:00	Satellite Symposium	Grand Ballroom	Speaker
THOMAS, S (India)	10th Aug	11:00-12:30	Post Main Session	Waterfront Ballroom 1	Chair
THOMAS, S (India)	10th Aug	11:00-12:30	Post Main Session	Waterfront Ballroom 1	Speaker
TRINKA, E (Austria)	8th Aug	11:00-12:30	Parallel Session	Waterfront Ballroom	Speaker
TRINKA, E (Austria)	8th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Speaker
TRINKA, E (Austria)	9th Aug	08:15-09:00	ASEPA Didactic Lecture	Grand Ballroom	Speaker
TRIPATHI, M (India)	9th Aug	13:30-15:00	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
TRIPATHI, M (India)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
TRIPATHI, M (India)	10th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
TSAI, J-J (Taiwan)	8th Aug	09:00-10:30	Main Session	Grand Ballroom	Chair
TSAI, J-J (Taiwan)	9th Aug	11:00-12:30	Parallel Session	Canary Room	Speaker
TSAI, J-J (Taiwan)	9th Aug	15:00-16:00	Platform Session	Canary Room	Chair
TSENG, Y (Taiwan)	9th Aug	16:30-17:30	Platform Session	Canary Room	Speaker
TUN, N (Myanmar)	10th Aug	08:00-08:45	ASEPA Didactic Lecture	Waterfront Ballroom	Chair
VAJDA, F (Australia)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Chair
VAJDA, F (Australia)	8th Aug	11:00-12:30	Parallel Session	Riverfront Ballroom	Speaker
VAJDA, F (Australia)	9th Aug	09:00-10:30	Epilepsy & Society Symposium	Galleria Ballroom	Speaker
VISUDTIBHAN, A (Thailand)	9th Aug	16:30-17:30	Video Quiz	Grand Ballroom	Chair
VORACHIT, S (Laos)	8th Aug	15:00-17:30	GCAE Forum	Galleria Ballroom	Speaker
WANG, Y (China)	9th Aug	09:00-10:30	Main Session	Grand Ballroom	Speaker
WANIGASINGHE, J (Sri Lanka)	8th Aug	15:00-16:00	Platform Session	Waterfront Ballroom	Speaker
WIDJAJA, E (Indonesia)	7th Aug	08:15-11:45	ASEPA Teaching Course	Cardinal Room	Speaker
WIEBE, S (Canada)	8th Aug	11:00-12:30	Post Main Session	Grand Ballroom	Speaker
WIEBE, S (Canada)	9th Aug	15:00-16:00	Special Session	Grand Ballroom	Speaker
WU, Y-L (Taiwan)	8th Aug	13:30-15:00	Satellite Symposium	Grand Ballroom	Chair
YAMAZAKI, M (Japan)	10th Aug	09:00-10:30	Main Session	Waterfront Ballroom	Speaker
YI, WX (China)	8th Aug	17:30-19:00	Satellite Symposium	Grand Ballroom	Speaker
ZHANG, H (China)	8th Aug	15:00-16:00	Platform Session	Riverfront Ballroom	Speaker
ZHOU, D (China)	10th Aug	11:00-12:30	Post Main Session	Waterfront Ballroom 1	Speaker

31st International Epilepsy Congress

Istanbul, Turkey

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31st International Epilepsy Congress
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EXHIBITION INFORMATION

EXHIBITION OPENING HOURS

Thursday 7th August **
Friday 8th August 09.00 – 16:30
Saturday 9th August 09.00 – 16:30

** Exhibition stands on level 4 may be open during the afternoon and evening of Thursday 7th August during sessions and the Welcome Ceremony and Reception

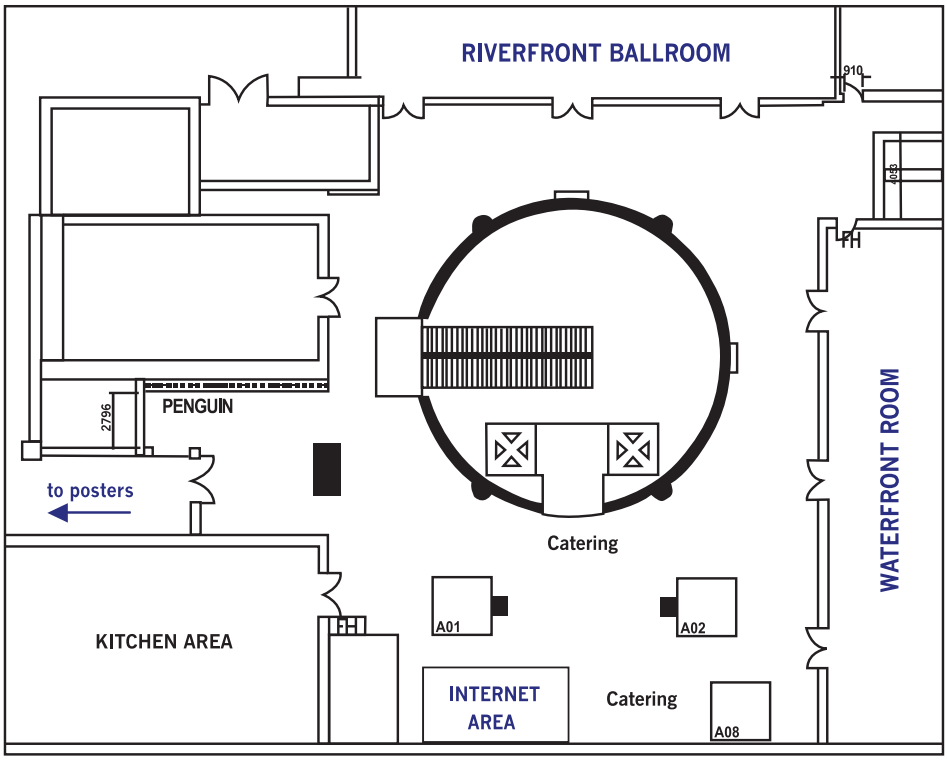
LIST OF EXHIBITORS

EXHIBITOR	STAND NO.
Cadwell	A01
EB Neuro SpA	B10
Eisai	B09
Elekta	B05
International Bureau for Epilepsy	B04
International League Against Epilepsy	B04
John Libbey Eurotext	B07
Lifelines Ltd	A08
Natus Neurology Inc.	B06
Sanofi	A02

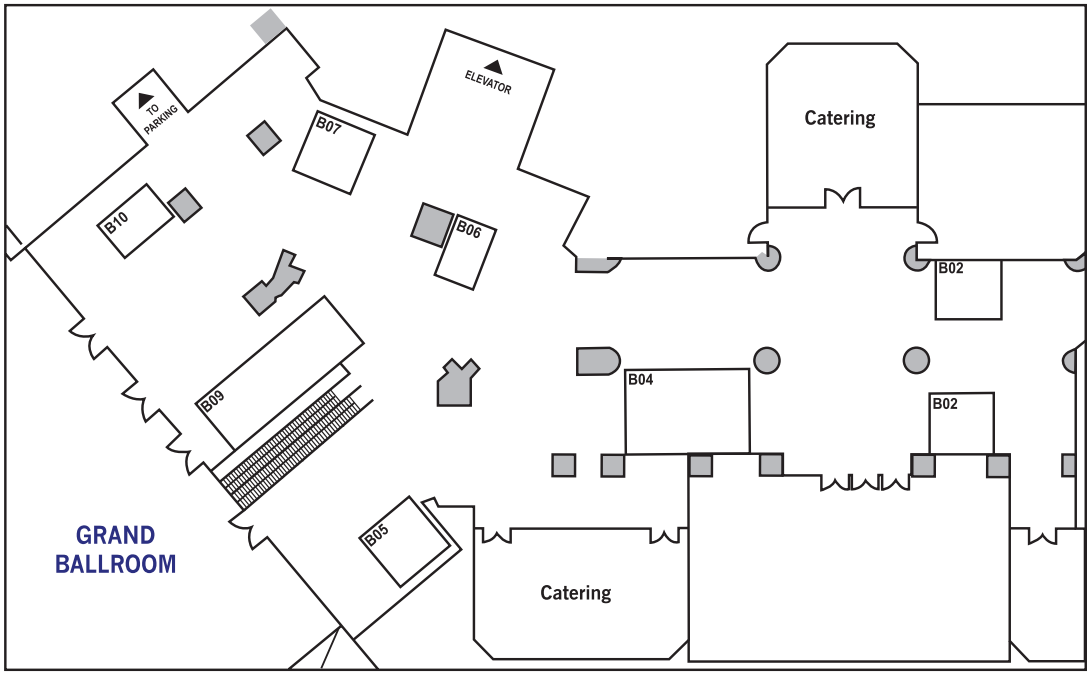
EXHIBITION INFORMATION

EXHIBITION FLOOR PLAN

Level 2:



Level 4:



PLATFORM SESSIONS

AED issues
Friday 8th August
15:00-16:00
Waterfront Ballroom, Level 2
Refer to pages 83-86 for abstracts

Chair: Man Mohan MEHNDIRATTA (India)

001 **YKP3089 in partial-onset seizures: a randomized, double-blind, placebo-controlled study**
LEE SK[1], VARADARAJULU R[2], FRENCH JA[3], ILANKUMARAN P[3], KAMIN M[3] ([1]Korea, Republic of, [2]India, [3]United States)

002 **Comparison of outcomes of phenytoin, sodium valproate and levetiracetam in the management of convulsive generalised convulsive status epilepticus: a prospective randomized controlled study**
MUNDLAMURI RC, SINHA S, SATISHCHANDRA P, NAGAPPA M, TALY AB, MAHESWAR RAO U, PRATHYUSHA PV, SUBBAKRISHNA DK (India)

003 **I.V. Levetiracetam versus I.V. Phenobarbitone as first choice monotherapy for neona tal seizures: a randomized, single blind prospective clinical trial**
MAHMOUD A, MANSY A, AL KHALAF M, AL TANNIR M (Saudi Arabia)

004 **Outcome of disabling seizures following anti-epileptic drug (AED) changes in chronic uncontrolled epilepsy**
SAW J, LAWN N, CHAN J, DUNUVILLE J, DUNNE J (Australia)

005 **Randamised, single blind clinical trial on intramuscular long acting ACTH versus oral prednisolone for control of epileptic spasms**
WANIGASINGHE J, ARAMBEPOLA C, SRIRANGANATHAN S, SUMANASENA S, INFAN TILE SPASMS STUDY GROUP, SRI LANKA (Sri Lanka)

Surgery
Friday 8th August
15:00-16:00
Riverfront Ballroom, Level 2
Refer to pages 86-89 for abstracts

Chair: Guoming LUAN (China)

006 **Posterior quadrant disconnection surgery for Sturge-Weber syndrome**
SUGANO H, NAKAJIMA M, HIGO T, IIMURA Y, ARAI H, JUNTENDO EPILEPSY CENTER (Japan)

007 **Focal cortical dysplasia type II: clinical features and surgical outcome in 81 patients**
LIU C, LUAN G (China)

PLATFORM SESSIONS

008 **Improved outsomes with earlier surgery for cavernomas-related epilepsy**
ZHANG H, FANG Y (China)

009 **Tailored frontal lobectomy after posterior quadrantectomy versus functional hemispherotomy for hemispheric pediatric epilepsy patients**
KIM J-S, BAI H-J, YEOM I-S, KIM JH, PARK E-K, SHIM K-W, KIM H-D, KIM D-S (Korea, Republic of)

010 **The antiepileptic efficacy of anterior thalamic electrical modulation in adult patients with intractable seizures**
SITNIKOV A, GRIGORYAN Y, MISHNYAKOVA L (Russian Federation)

Genetics and populations
Friday 8th August
16:30-17:30
Canary Room, Level 4
Refer to pages 89-92 for abstracts

Chair: Patrick KWAN (Australia)

011 **Novel SCN3A mutations in epilepsy patients with febrile seizures and mental retar dation**
CHEN Y, LIAO W, ZENG Y, TANG B, SHI Y, MENG H, XU H, MIN F, YU L, YI Y, LI B, GUO J (China)

012 **HLA-A*2402 as a common genetic risk factor for aromatic antiepileptic drugs induced Stevens-Johnson syndrome and toxic epidermal necrolysis in Han Chinese**
MIN F-L, SHI Y-W, ZHOU D, ZHOU J-H, HU X-S, HE N, QIN B, KWAN P, LIAO W-P (China)

013 **Multiplex families with epilepsy: a clinical and molecular genetic study of 211 families**
AFAWI Z[1], OLIVER KL[2], KIVITY S[1], MAZARIB A[1], BLATT I[1], NEUFELD M[1], KORCZYN A[1], BERKOVIC SF[2], ISRAELI COLLABORATIVE PROJECT ([1]Israel, [2]Australia)

014 **Somatic activating mutations in mTOR cause focal cortical dysplasia**
KIM D-S, LEE J-H, KIM J-H, KIM J-S, KIM H-D, KANG H-C, SHIM K-W (Korea, Republic of)

015 **The present situation of epilepsy in the rural areas of Jilin province and the standardization pharmacal medicine treatment**
LUO N, SUN L, LIN W (China)

PLATFORM SESSIONS

Epileptogenesis and basic science
Saturday 9th August
15:00-16:00
Waterfront Ballroom, Level 2
Refer to pages 92-95 for abstracts

Chair: Weiping LIAO (China)

016 **Temporal differences in microRNA expression patterns in rat hippocampus and cere bral cortex after developmental seizures**
LIU L-J, LIU L-Q, MAO D-A, XIONG J (China)

017 **Inflammatory mediators role in Epileptgenesis caused by Cavernous angioma**
NAKAJIMA M, SUGANO H, HIGO T, IIMURA Y, SUZUKI H, HARADA Y, KARAGIOZOV KL, ARAI H (Japan)

018 **HHV-7 in adults with drug-resistant epilepsy: a pathological role in hippocampal sclerosis?**
LI J-M, HUANG C, WANG W, LEI D, ZHOU D (China)

019 **Fasudil ameliorate the severity of lithium-pilocarpine induced status epilepticus in rats**
ZHANG Q, DING J, FAN F, PENG W, WANG X (China)

020 **Actions of dehydroepiandrosterone (DHEA) on experimental model of post-traumatic epilepsy: effects on electroencephalography, cognition, glutamate levels and Na^+ K^+ -ATPase activity**
MISHRA M, SINGH R, SHARMA D (India)

Abstract Book

Presurgical evaluation and surgery
Saturday 9th August
15:00-16:00
Canary Room, Level 4
Refer to pages 95-98 for abstracts

Chair: Jing-Jane TSAI (Taiwan)

021 **Validity evaluation of [11C]-Verapamil PET in patients with intractable epilepsy**
SHIN J-W, MOON J, LEE S-T, JUNG K-H, SUNWOO J, BYUN J-I, CHU K, LEE SK (Korea, Republic of)

022 **Determination of language dominance using Shiritori (last and first) loaded f-MRI: comparison with propofol Wada test**
KASHIDA Y, OTSUBO T, HANAYA R, KODABASHI A, TSUMAGARI N, SUGATA S, HOSOYA MA H, IIDA K, NAKAMURA K, FUJIMOTO T, ARITA K (Japan)

023 **Definition of a stereotactic 3D model of the human insula for neurosurgical approach (epilepsy and stereotaxic surgery)**
AFIF A, BECQ G, MERTENS P (France)

PLATFORM SESSIONS

024 **Mapping interictal high-frequency oscillations (60~500 Hz) in human neocortical epilepsy with intracranial macroelectrodes**
JIN D, SEO J-H, JOO EY, ABIBULLAEV B, CHOI SJ, SEO DW, HONG SC, HONG SB (Korea, Republic of)

025 **Spatial congruence of magnetoencephalography spike dipoles for focal cortical dysplasia**
NAKAJIMA M, WIDJAJA E, SATO Y, BOELMAN C, BABA S, SAKUMA S, OKANARI K, CHUANG SH, RUTKA JT, JAMES D, OCHI A, OTSUBO H (Canada)

Seizure diagnosis and neurophysiology
Saturday 9th August
15:00-16:00
Riverfront Ballroom, Level 2
Refer to pages 98-101 for abstracts

Chair: Ernie SOMERVILLE (Australia)

026 **The role of the direct directed transfer function in identifying the primary epileptogenic zone from generalized sharp and wave discharges in Lennox-Gastaut syndrome**
HUR YJ, LEE JS, KANG HC, KIM HD (Korea, Republic of)

027 **A phone App to diagnose epileptic seizures: a useful tool to reduce the epilepsy treatment gap in Asia**
PATTERSON V[1,2], SINGH M[3], RAJBHANDARI H[2] ([1]United Kingdom, [2]Nepal, [3]India)

028 **Role of short term video electroencephalography with induction by verbal suggestion in the diagnosis of transient unresponsiveness with suspected psychogenic non-epileptiform seizure-like symptoms**
DESAI SD, DESAI DS, JANI T (India)

029 **Symptomatic epileptic seizure in neurointensive care unit**
LOBJANIDZE N, AKIASHVILI N, MAISURADZE T (Georgia)

030 **Lateralizing and localizing signs in children with focal epilepsy**
TAN EMJ, CHAN DWS (Singapore)

Neuropsychology and social
Saturday 9th August
16:30-17:30
Canary Room, Level 4
Refer to pages 102-105 for abstracts

Chair: Kheng-Seang LIM (Malaysia)

PLATFORM SESSIONS

031 **The modifiable psychosocial factors influencing epilepsy care among persons with epilepsy: a cross sectional tertiary care hospital based study**
KULKARNI C, LOHIT K, SARMA GR (India)

032 **Past and present public familiarity, knowledge and attitudes toward epilepsy in Taiwan**
TSENG Y, LIN H, HSIEH L (Taiwan, Republic of China)

033 **A cross sectional study of the neuropsychiatric profile of children with epilepsy and their siblings using the mini international neuropsychiatric interview for children and adolescents**
MANALAC ALS, LUSPO PV, ORTIZ MH (Philippines)

034 **Sleep problems and impact on quality of life in children with epilepsy**
THAMPRATANKUL L, CHAREONSANTI S, KONGKHATITHUM C, VISUDTIBHAN A (Thailand)

035 **Anxiety and depression in adolescents with epilepsy**
KWONG LK (Hong Kong)

Outcomes and neuroimaging
Saturday 9th August
16:30-17:30
Galleria Ballroom, Level 3
Refer to pages 105-107 for abstracts

Chair: Wendyl D'SOUZA (Australia)

036 **T2 relaxometry in prognosticating seizure outcome at 6 months in patients with solitary cerebral cysticercosis**
NALINI A, DE SOUZA A, SAINI J (India)

037 **Cerebellar white matter changes in partial epilepsy without structural lesions on MRI**
KIM SE, KIM HY (Korea, Republic of)

038 **Adults with a new diagnosis of epilepsy have increased risk of mortality for at least 10 years after diagnosis**
HAKAMI T[1,2], MCINTOSH AM[1], TODARO M[1], LIEW D[1], KWAN P[1], YERRA R[1], TAN M[1], FRENCH C[1], LI S[1], O'BRIEN TJ[1] ([1]Australia, [2]Saudi Arabia)

039 **Fetal loss patterns in women with epilepsy**
JITHA J, SREEVIDYA D, SABARINATHAN S, THOMAS SV (India)

040 **Long term sequelae of amygdala enlargement in mesial temporal lobe epilepsy**
SANDY S, SINGH S, HADER W, MYLES T, SCOTT J, WIEBE S, PILLAY N (Canada)

POSTERS ON DISPLAY

Adult epileptology
Refer to pages 108-121 for abstracts

p041 **Structure of epileptic seizures in patients with severe traumatic brain injury**
TRIFONOV I, KRYLOV V, TALYPOV A (Russian Federation)

p043 **Practical use of levetiracetam as adjunctive therapy in Japan - interim analysis of drug use-results survey for levetiracetam (E-Keppra® tablet) in adults with par tial-onset seizures**
ARAI M, YAMADA M, TOKUMASU T, SHIRAI H, YAMAMURA K, KASAMO K (Japan)

p044 **Unusual cases of symptomatic seizure**
SHAAFI S (Iran, Islamic Republic of)

p045 **Seizure in Alzheimer disease**
TABRIZI N, ETEMADIFAR M, ABEDINI M (Iran, Islamic Republic of)

p047 **Safety and efficacy of Zonisamide in treatment of partial, generalized or combined epilepsy in Indian adults**
RAVAT S, SRINIVASAN A, JYOTHI B, DEMUDUBABU B, KUMAR V, BAJPAI V, CHAVAN C, DASH A (India)

p048 **Efficacy and tolerability of Zonisamide in partial onset seizures in Indian adults: a sub-analysis**
CHAVAN C, SRINIVASAN A, DIVATIA R, ACHTANI R, BINIWALE AA, KIRAN A, NARAYANA R, VARKEY B, DASH A, MISHRA S, KAUR D (India)

p049 **Efficacy and safety of Zonisamide as 1st add on to existing AEDs in Indian adults with partial, generalized or combined seizures: a sub-analysis**
DASH A, SRINIVASAN A, RAVAT S, JYOTHI B, KIRAN A, KUMAR V, BAJPAI V, ACHTANI R, KAUR D, MISHRA S (India)

p050 **Predictors of spontaneous seizure remission in patients of medically refractory epilepsy due to mesial temporal sclerosis (MTS)**
DHIMAN V, SINHA S, ARIVAZHAGAN A, MAHADEVAN A, BHARATH RD, SAINI J, JAMUNA R, RAO MB, SHANKAR SK, SATISHCHANDRA P (India)

p051 **Levetiracetam monotherapy in young female patients with juvenile myoclonic epilepsy**
KIM J, KOO M (Korea, Republic of)

p052 **Autism and intellectual disability in Lennox-Gastaut syndrome**
XU H-Q, HE N, LI Z-X, LI B-M, LIU X-R, YU L, WANG C, LIAO W-P (China)

p053 **Comorbidities in Epileptic Patients**
AYDOGAN S, KUTLU G, INAN LE (Turkey)

POSTERS ON DISPLAY

p054 **Non-stiff anti-amphiphysin syndrome: clinical manifestations and outcome after immunotherapy**
MOON J, SHIN J-W, BYUN J-I, SUNWOO J-S, JUNG K-H, LEE S-T, CHU K, LEE SK (Korea, Republic of)

p055 **Validation of seizure questionnaire in predicting diagnosis and classification**
BAZIR AHMAD SA, LIM KS, WO M, ISMAIL NS, SHANIZAN NS, IBRAHIM F, TAN CT (Malaysia)

p056 **Is telephonic follow-up a feasible, effective and acceptable option for epilepsy patients in India? A randomized controlled trial**
BAHRANI K, SINGH MB, BHATIA R, VIBHA D, VISHNUBHATLA S, PRASAD K (India)

p057 **Which frequency comes first in intracranial EEG ictal onset: high or low?**
CHUNG JM[1], MAOZ U[1], RUTISHAUSER U[1], TUDUSCIUC O[1], TSUCHIYA N[2], YE S[1], MAMELAK AN[1], ELIASHIV DS[1] ([1]United States, [2]Australia)

p058 **Epileptic seizures in patients during posttraumatic period**
TOSHEV J, MUSAEVA Y (Uzbekistan)

p059 **Epilepsy in patients with stroke**
MUSAEVA Y, RAKHIMBAYEVA G, TOSHEV J, KURANBAYEVA S (Uzbekistan)

p060 **Epileptical manifestations of long-term functional outcome in case of different stroke subtypes**
AZIZOVA R, RAKHIMBAEVA G, MAKHMUDOV A (Uzbekistan)

p061 **Serum natural neurotropic autoantibodies in epilepsy patients**
YUNUSOV F, AZIZOVA R, RAKHIMBAEVA G (Uzbekistan)

p062 **A study on clinical, electrophysiological, radiological characteristics of new onset epilepsy in elderly population**
MOTURI P, TURAGA S, ANUSHA R (India)

p063 **Establishing an etiology for medically controlled and refractory focal epilepsy - cross sectional data from an Indian quarternary care teaching hospital**
AGARWAL P, SHUKLA G, GARG A (India)

p064 **Early electroencephalography in patients with Emergency Room diagnoses of new-onset seizures: diagnostic yield and impact on clinical decision-making**
PALIWAL PR, RATHAKRISHNAN R (Singapore)

p065 **Erythropoietin reduces cytokines secreted by PBMC in idiopathic epilepsy patients**
MAO L-Y, DING J, WANG X (China)

p066 **Quality of life in adults on the ktetogenic diet**
NATHAN J (India)

POSTERS ON DISPLAY

AED issues

Refer to pages 122-137 for abstracts

p067 **Anticonvulsant activity and mechanism of action of ginger (Zingiber officinale Roscoe) rhizomes**
AWAD EM, AHMED EM, ELHADIYAH TM (Sudan)

p068 **Zonisamide, a practical alternative for the treatment of epilepsy. Clinical experiences in Japan**
MITSUEDA-ONO T, TOGAWA J, NAKAOKU Y, HAGIWARA M, MURAKAMI G, MATSUI M (Japan)

p069 **Post marketing surveillance on the use of Zonisamide for epilepsy in the Philippines**
ROBENIOL GT, BAROQUE AC, GAN HH (Philippines)

p070 **Post marketing surveillance on the use of Zonisamide as monotherapy for epilepsy in the Philippines**
ROBENIOL GT, BAROQUE AC, GAN HH (Philippines)

p071 **Post marketing surveillance on the use of Zonisamide as add-on treatment for epilepsy in the Philippines**
ROBENIOL GT, BAROQUE AC, GAN HH (Philippines)

p072 **Making epilepsy treatment more affordable: can rationalizing prescriptions reduce cost?**
KAPOOR S[1], SINGH M[1], PATTERSON V[2], PRASAD A[3], VISHNUBHATLA S[1] ([1]India, [2]United Kingdom, [3]Canada)

p073 **Validity of polymerase chain reaction (PCR) allele specific test for rapid detection of human leukocyte antigen (HLA)-B*1502 allele status in Singapore paediatric neurology patients**
CHOW C, ZU Y, TAN M-H, CHING LK, YING JY, LAW HY, CHAN DWS (Singapore)

p074 **Impact of concomitant antiepileptic drugs on perampanel efficacy and tolerability**
KWAN P[1], BRODIE MJ[2], LAURENZA A[3], GIDAL BE[3] ([1]Australia, [2]United Kingdom, [3]United States)

p075 **The influence of ABCB1 rs2032582 polymorphism on the risk of drug-resistant epilepsy**
QIU G, YI Y-H (China)

p076 **Increased homocysteine levels in valproate treated epileptic patients: a meta-analysis**
NI G, QIN J, FANG Z, CHEN Y, CHEN Z, ZHOU J, ZHOU L (China)

p077 **The value of anti-epileptic medication (AEM) blood level determination**
STEPANOVA D, BERAN RG (Australia)

p078 **Abuse of pregabalin and gabapentin by prisoners**
MENGULLU N, TOSUN O, MELEK I, YIGITTURK D, KARBEYAZ K (Turkey)

POSTERS ON DISPLAY

p079 **Oligohydrosis as adverse effect of Zonisamide**
SON J (Korea, Republic of)

p080 **Topiramate use and the risk of glaucoma development in children; a pilot study from Lady Ridgeway Hospital for Children, Colombo, Sri Lanka**
MANDADIGE SS, RATNAYAKE N, DILOSHINI THAR, WANIGASINGHE J, RATNAYAKE P, IRUGALBANDARA D, ARAMBEPOLA C (Sri Lanka)

p081 **Drug-related problem in epilepsy clinic at Srinagarind Hospital,Thailand**
TUNTAPAKUL S, LERTSINUDOM S, TOPARK-NGARM A, TIAMKAO S, INTEGRATED EPILEPSY RESEARCH GROUP (Thailand)

p082 **Drug-drug interactions affecting seizure control in an epilepsy clinic**
TOPARK-NGARM A, LERTSINUDOM S, VONGKASAMCHAI N, TIAMKAO S, INTEGRATED EPILEPSY RESEARCH GROUP (Thailand)

p083 **Influence of patient adherence on seizure control: evidence from an epilepsy clinic in a tertiary care university hospital**
LERTSINUDOM S, TOPARK-NGARM A, VONGKASAMCHAI N, TIAMKAO S, INTEGRATED EPILEPSY RESEARCH GROUP (Thailand)

p084 **Pilot study to estimate starting dosages of levetiracetam for elderly people**
MIYAMOTO T, KUSUMI I (Japan)

p085 **Effect of provocative factors on seizure control: evidence from an epilepsy clinic in a tertiary care university hospital**
VONGKASAMCHAI N, LERTSINUDOM S, TOPARK-NGARM A, TIAMKAO S, INTEGRATED EPILEPSY RESEARCH GROUP. (Thailand)

p086 **Efficacy and tolerability of sodium valproate in our paediatric population: a case series in the local population**
WANG FS, ONG H-T, CHIAM JE, LOW P-C, LIM KJ (Singapore)

p087 **Efficacy and safety of adjunctive perampanel for the treatment of refractory partial seizures in Asian patients: a subanalysis of pooled Phase III study data**
TSAI J-J[1], WU YL[1], GULHANE M[2], DASH A[2], DHADDA S[3] ([1]Taiwan, Republic of China, [2]India, [3]United States)

p088 **Methylpednisolone pulse therapy of MAE**
WANG J, SHAN L, CHEN Y, CHEN Y (China)

p089 **Levetiracetam-induced skin rash and its association with the HLA genes in Chinese patients with epilepsy**
HU F-Y, WANG W, REN J-C, YANG H-Y, ZHOU D (China)

p090 **Effects of long term antiepileptic drugs on serum vitamin D level in a cohort of Sri Lankan children with epilepsy**
GINIGE N, DE SILVA KSH, WANIGASINGHE J, GUNAWARDENA N, MUNASINGHE J (Sri Lanka)

POSTERS ON DISPLAY

p091 **Epilepsy control with phenobarbital: observational study among Filipino children**
SALONGA AM, DE OCAMPO FS, CRUCILLO CMA, SANCHEZ-GAN BC (Philippines)

p092 **Levetiracetam or valproic acid monotherapy of low dosage for children with typical benign childhood epilepsy with centrotemporal spikes (BECTS)**
XIAO F, AN D, DENG H, REN J, ZOU X, CHEN S, ZHOU D (China)

Basic science
Refer to pages 137-145 for abstracts

p094 **Molecular mechanisms of tumor-related epilepsy**
TABRIZI N, ABEDINI M (Iran, Islamic Republic of)

p095 **Aquaporin 4 is increased in the splenium of corpus callosum after pilocarpine induced status epilepticus**
SONG HK, CHOI HC, SUH SW, SHIN DJ, KANG TC (Korea, Republic of)

p096 **Age-specific effect of postnatal exposure to morphine on pilocarpine-induced seizure in mice**
SABOUNI R, GHATEFAR R, FADAEI A, SABOORY E (Iran, Islamic Republic of)

p097 **Interleukin-1β increases epileptogenesis after prolonged febrile seizures through cannabinoid type 1 receptor signaling**
FENG B, TANG Y, CHEN B, WU D, ZHANG X, CHEN Z (China)

p098 **Postnatal interleukin-1β after experimental prolonged febrile seizures enhances epileptogenesis in adulthood**
FUKUDA M, ITO M, YANO Y, TAKAHASHI H, SUZUKI Y, MORIMOTO T, ISHII E (Japan)

p099 **High mobility group box 1 enhances hyperthermia-induced seizures in developing rats**
ITO M, FUKUDA M, YANO Y, TAKAHASHI H, SUZUKI Y, MORIMOTO T, ISHII E (Japan)

p100 **Preventive effect of Levetiracetam against the pathological changes in hippocampus of temporal lobe epilepsy model mice**
HIGO T, SUGANO H, NAKAJIMA M, IIMURA Y, ARAI H (Japan)

p101 **Expression and distribution of HMGB1 in Sombati's cell model and kainic acid induced epilepsy model**
WU Y, HUANG J-S, LI S-J, YE J-M, LIU Q-D (China)

p102 **Essential oil *from* Aconitum *cochleare* modulates the gene expression of *BDNF*, *TrkB* and oxidative stress parameters in a mouse model of epileptogenesis with safe toxicity profile**
MALHI SM, MAZHAR F, ZEESHAN M, CHAUDHARY MI, SHAHEEN F, SIMJEE SU (Pakistan)

POSTERS ON DISPLAY

p105 **Memory impairment caused by spreading depression modulated by injection of Nifedipine**
LOTFINIA M (Iran, Islamic Republic of)

p106 **Spreading depression enhances neurogenesis in hippocampus and dentate gyrus**
LOTFINIA M (Iran, Islamic Republic of)

p107 **The antiepileptic and neuroprotection role of Scl element in experimental study**
WANG Z, LIN W, ZHANG G (China)

p108 **Effects of α-asarone on transient outward potassium current in vitro primary culture of hippocampal neurons of rat**
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p109 **The expressions of ERK1/2, Caspase-3 in the human brain with refractory epilepsy**
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p182 **Brain levels of kynurenic acid, a glutamate receptor inhibitor, is altered in patients with drug-resistant epilepsy**
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p215 **Abatement of epileptic spike-wave discharges in an epileptic neural population model**
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p220 **Utility of EEG in diagnosis of epileptic and non epileptic seizures at Cipto Mangunkusumo Hospital, Jakarta, Indonesia**
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p221 **Bringing people with epilepsy closer to treatment in low and middle income countries (LMICS) -- time to get inspired by local initiatives**
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p226 **Reduced serum PON1 activity and oxidative stress in children with intractable epilepsy**
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p232 **Quality of life of Thai children with benign rolandic epilepsy**
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p233 **Reduction of carbamazepine-related allergic skin reactions through HLA genotype screening**
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p234 **Hemorrhagic stroke and developed symptomatic epilepsy in children**
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p236 **Paroxysmal non-epileptic events in infants and toddlers: a semiology study**
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p239 **Comparison of the success of different drug treatments for West syndrome: a single centre 10-year review from Singapore**
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p240 **The pathogenesis of childhood absence epilepsy: NIPA2 mutations enhancing excitability of thalamocortical network through increasing NMDAR strength**
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p241 **Socio-economic status effects in pediatric cerebral palsy comorbid epilepsy: a national cohort study**
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p244 **The clinical, electroencephalographic and genotypic characteristics of SCN1A mutation-positive Dravet syndrome**
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p245 **The efficacy of rectal diazepam in aborting seizures in paediatric patients following caregiver education: a single-centre Singapore experience**
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PLATFORM SESSION ABSTRACTS

AED issues
Friday 8th August
15:00-16:00
Waterfront Ballroom, Level 2

001

YKP3089 in partial-onset seizures: a randomized, double-blind, placebo-controlled study

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Purpose: YKP3089, a tetrazole alkyl carbamate derivative, is a new investigational antiepileptic drug (AED) with a potentially unique mechanism of action and a pharmacokinetic profile suited to once-daily dosing. This randomized, double-blind, placebo-controlled study assessed efficacy and tolerability in patients with refractory epilepsy.
Method: Adults with partial-onset seizures (≥3/28 days in 8-wk baseline despite 1-3 AEDs) were randomized to placebo or to adjunctive 200 mg YKP3089 which was titrated over 6 wks (50 mg increments at 2-wk intervals) and maintained for 6 wks. Primary endpoint was median % seizure reduction from baseline. Secondary endpoints included % patients with ≥50% seizure reduction (responder rate); % of study completers with no seizures in maintenance; median % seizure reduction by seizure type.
Results: Patient characteristics were similar at baseline (YKP3089, N=113; placebo, N=108). Median seizure reduction (YKP3089 vs placebo): 56% vs 22%, P< 0.0001. Responder rate: 50% vs 22%, P< 0.0001. Seizure-free during maintenance phase: 28% vs 9%. Significant difference favored YKP3089 over placebo across all partial-onset seizure types. Seizure reduction was observed during titration when patients were receiving 50-100 mg YKP3089. Most common adverse events were somnolence (22% vs 12%), dizziness (21% vs 17%), fatigue (11% vs 6%), headache (11% vs 11%), nystagmus (10% vs 0). Nervous system/GI adverse events included balance disorder (8% vs 1%), tremor (6% vs 2%), constipation (5% vs 0), diarrhea (5% vs 0), vomiting (5% vs 2%).
Conclusion: YKP3089 was highly effective vs. placebo in reducing partial-onset seizures in patients with refractory epilepsy. No unexpected safety or tolerability issues were identified.
Study sponsored by SK Life Science Inc.

002

Comparison of outcomes of phenytoin, sodium valproate and levetiracetam in the management of convulsive generalised convulsive status epilepticus: a prospective randomized controlled study

MUNDLAMURI RC[1], SINHA S[1], SATISHCHANDRA P[1], NAGAPPA M[1], TALY AB[1], MAHESWARRAO U[2], PRATHYUSHA PV[3], SUBBAKRISHNA DK[3]
[1]NIMHANS, Neurology, Bangalore, India, [2]NIMHANS, Neuroanaesthesia, Bangalore, India, [3]NIMHANS, Biostatistics, Bangalore, India

Purpose: This randomised controlled prospective study was conducted to compare the efficacy of phenytoin, valproate and levetiracetam in patients with GCSE.
Method: This randomised controlled prospective study was conducted on 150 patients to compare the efficacy of phenytoin (n=50), valproate (n=50) and levetiracetam (n=50) along with lorazepam in patients with GCSE. All the recruited patients received i.v. lorazepam (0.1mg/kg) followed by one of the 3 AEDs viz. phenytoin (20 mg/kg), valproate (30 mg/kg), and levetiracetam (25 mg/kg). Those who remained uncontrolled, received other AEDs sequentially. The clinical,

imaging, EEG, etiological factors were analyzed. Predictors of poor seizure control and outcome at discharge and after a month were assessed.
Results: In the phenytoin subgroup, the seizures could be controlled in 34 (68%) with lorazepam+phenytoin infusion. In the valproate subgroup (n=50), seizures could be controlled in 34 (68%) with lorazepam +valproate infusion. In the levetiracetam subgroup (n=50), seizures could be controlled in 39 (78%) with lorazepam + levetiracetam infusion. There was no statistically significant difference between the subgroups (p=0.44). Overall, following lorazepam and 1st AED, 107/150 (71.3%) were controlled; with addition of 2nd AED, 130/150 (86.7%) and by adding 3rd AED, 138/150 (92%) were controlled. Fifteen out of 110 (13.6%) expired within 1 month of SE: phenytoin-6; valproate-4; and levetiracetam-5.
Conclusion: Phenytoin, valproate, and levetiracetam are safe and equally efficacious following lorazepam in GCSE. The choice of AEDs could be individualised based on co-morbidities. In resource poor setting, SE could be controlled in 92% of patients with AEDs only and anaesthetics were not required.

003

I.V. Levetiracetam versus I.V. Phenobarbitone as first choice monotherapy for neonatal seizures: a randomized, single blind prospective clinical trial

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Purpose: Neonatal seizures are relatively common, with variable clinical manifestations. Treatment aims at ruling out immediately treatable causes. Few studies are available about the safety and efficacy of commonly used antiepileptic drugs for neonatal seizures. The standard treatment has been Phenobarbitone (PB) usually given as I.V. and followed when successful, by oral form.
Need for new drugs for the treatment of neonatal seizures is essential.
Recently Levetiracetam (LEV) was studied in few studies in the neonatal period with promising results.
Objective: to compare the safety and efficacy of LEV with PB in the treatment of neonatal seizures.
Method: a comparative randomized single blind parallel trial, with crossover to the alternate group as add-on therapy when failure on the assigned drug is experienced.
It is monophasic.
22 neonates (birth to 28 days of age) with clinical seizures were recruited from the Neonatal Intensive Unit. They were randomized into two groups, utilizing one of the readily available programs of randomization on the internet.
Group 1: treated with Intravenous PB with possible switch to I.V. LEV if the former fails, while group 2 treated with I.V. LEV with possible switch o PB if the former fails.
Results: Data were represented as number either percentage or mean+- SD.
Conclusion: Both PB and LEV were found to be effective in abolishing neonatal seizures. In our small sample the efficacy of LEV was 100% as it was effective in controlling all seizures without need of another antiepileptic drug, while it was 83% in PB as it needed one drug in one patient and two drugs in the other to control their seizures.
The side effects were more on the side of PB. So we conclude that both LEV and PB were effective with relative superiority in both efficacy and safety on the side of LEV.

PLATFORM SESSION ABSTRACTS

004

Outcome of disabling seizures following anti-epileptic drug (AED) changes in chronic uncontrolled epilepsy

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Purpose: To analyse the outcome of disabling seizures following AED changes in patients with refractory epilepsy.

Background: The mainstay of refractory epilepsy treatment is sequential alteration of AEDs. Even with continued seizures, a reduction of disabling seizures may be a worthwhile outcome. There is little data analyzing outcome according to seizure type. Randomised add-on AED studies have suggested a greater benefit for tonic-clonic seizures (TCS), but the short observation period and exclusion criteria limit the applicability of these findings.

Method: Prospective study of adults with chronic uncontrolled epilepsy, of ≥5 years duration with at least 1 seizure per month despite adequate trials of at least 2 AEDs. The outcome in patients withTCS and/or drop attacks (tonic, atonic and other) following addition of a previously unused AED was analysed after at least one year of follow up, and compared to 47 patients who elected to continue treatment unchanged ("controls").

Results: 147 AED changes were made in patients with TCS or drop attacks, 77% with focal epilepsy. Median number of prior AEDs was 7, and 17% had prior epilepsy surgery. The frequency of TCS or drop attacks was reduced by ≥50% at 6 months in 27% (8% in controls, p=0.009), falling to 16% at 12 months (8% controls p=0.32). 10% were seizure free at 6 months (0% of controls, p=0.02) and 5% at 12 months (0% of controls, p=0.34). The number of responders with TCS or drop attacks was significantly lower than for all seizure types but the proportion seizure free was no different.

Conclusion: AED changes were of some, but limited, benefit for tonic clonic seizures or drop attacks in this group of patients with highly refractory epilepsy. AED changes did not produce a relatively greater improvement of disabling seizures.

005

Randamised, single blind clinical trial on intramuscular long acting ACTH versus oral prednisolone for control of epileptic spasms

WANIGASINGHE J[1], ARAMBEPOLA C[2], SRIRANGANATHAN S[3], SUMANASENA S[1], INFANTILE SPASMS STUDY GROUP, SRI LANKA

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Purpose: West syndrome is a devastating epileptic encephalopathy which is often difficult to treat. Hormonal therapy is currently established as its first line therapy. However, which form of hormonal therapy i.e. intra-muscular long acting tetracosactrine (ACTH) or oral prednisolone is more efficacious for spasm control is not yet known.

Method: A prospective randomized, single blind clinical trial was conducted in Sri Lanka. Ninety five newly diagnosed, previously untreated children with documented epileptic spasms, who demonstrated hypsarrhythmia on EEG, were randomized to receive oral prednisolone (PNL) or Adrenocorticotropine (ACTH) for 14 days according to doses used in United Kingdom Infantile Spasm Study protocol. This was tapered off over 3 weeks using PNL. Spasm control was evaluated at three different time intervals from commencement of therapy: Day-14, day-42 using a spasm diary and at 3 months based on parental report.

Results: Forty six (PNL) and 42(ACTH) infants completed the 14-day treatment protocol. Spasm

cessation by 14th day occurred in 60.9% with PNL in comparison to only 38% with ACTH (p=0.03). Mean number of days for spasm cessation was 3.85(SD=2.42) for PNL versus 8.47(SD=3.83) for ACTH (p=0.00). Absence of spasms at 42 days with or without anticonvulsants occurred in 42% with PNL versus 22% with ACTH (p=0.00). Absence of spasms on 3rd-month follow up ± anticonvulsants was 40% with PNL and 26% with ACTH (P=0.00). No significant difference in the side effect profiles were noted between the two treatment arms.
Conclusion: Early cessation of spasms (D14) as well as absence of spasms on follow up (6 weeks and 3 months) was significantly better with oral PNL than intramuscular ACTH. This is the world's first ever documentation of therapeutic supremacy of oral prednisolone (cheap and convenient) over intramuscular ACTH (expensive and invasive) for short term control of spasms in West syndrome.

Surgery
Friday 8th August
15:00-16:00
Riverfront Ballroom, Level 2

006
Posterior quadrant disconnection surgery for Sturge-Weber syndrome
SUGANO H[1], NAKAJIMA M[1], HIGO T[1], IIMURA Y[1], ARAI H[1], JUNTENDO EPILEPSY CENTER
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Purpose: Some patients with Sturge-Weber syndrome (SWS) need epilepsy surgery for adequate seizure control and prevention of psychomotor deterioration. Majority of patients with SWS have leptomeningeal angioma located over the temporal, parietal and occipital lobes. We applied posterior quadrant disconnection surgery for this type of SWS with intractable seizure. We evaluated the efficacy of this procedure in seizure control and psychomotor development.
Method: Surgically treated 10 patients using the posterior quadrantectomy (PQT) were enrolled in this study. Surgical outcome was analyzed as seizure-free or not at two years after surgery. Psychomotor development was evaluated by the scores of mental developmental index (MDI) and psychomotor developmental index (PDI) in the Bayley scales of infant development-II preoperatively, at 6- and 12-months after the PQT.
Results: Eight out of 10 patients resulted seizure free. Patients without complete elimination of the angiomatous areas had residual seizures. Average MDI and PDI before the surgery were 64.8 and 71.6, respectively. Scores of MDI at 6 and 12-month after the PQT in seizure free patients were 80.5 and 84.5, respectively ($P < 0.01$). PDIs at these post-operative intervals were 87.3 and 86.4, respectively ($P < 0.05$). Patients with residual seizures did not improve both in MDI and PDI.
Conclusion: The PQT achieved good seizure control and improved psychomotor development in patients with SWS. The complete deafferentation of angiomatous areas is required for seizure free results and psychomotor developmental improvement.

007
Focal cortical dysplasia type II: clinical features and surgical outcome in 81 patients
LIU C[1], LUAN G[1]
[1]*Capital Medical University, Beijing, China*

Purpose: The aim of this study is to analyze the clinical features and the prognostic factors after surgical treatment for Focal Cortical Dysplasia type II.
Method: we retrospectively studied 81 cases patients diagnosed as Focal Cortical Dysplasia by

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postsurgical pathology at Beijing Sanbo Brain Hospital during April 2008 and December 2011. Clinical features, seizure history, and operative data were collected for statistical analysis on prognostic indicators on postoperative seizure outcomes.
Results: 64.2% of all patients achieved Engel class I one year after surgery, with 60.9% of FCD Type IIA, which is mainly located at temporal lobe and 68.5% of Type IIB, which is majorly sited at frontal or parietal lobe. 58.5% pediatric patients got Engel class I, and 70.0% adult patients were Engel class I. 87.7% of all FCD type II were positive on MR, with 87.0% and 88.6% respectively of subtype IIA and IIB. FCD subtype IIB has an early age at first onset than subtype IIA (4.8 vs 7.5); while extratemporal FCD type II had an early age at first onset than temporal FCD type II, and patients with a history of febrile convulsion also showed an early age of first onset than that without such a anamnesis. We didn't find any disease-related factors such ascourse of seizure, age at surgery, MR positive, site of the lesion, risk factors like febrile convulsion, or the pathological subtype, have predictive meaning on postsurgical seizure freedom. But as to the treatment-related factors, we find complete resection of the lesion on MRI was the most important prognosticator.
Conclusion: FCD Subtype IIB has an early age at first onset than Subtype IIA, and is more frequently sited at extratemporal lobe rather than temporal lobe like subtype IIA. Complete resection of the lesion is the best treatment for FCD type II.

008

Improved outsomes with earlier surgery for cavernomas-related epilepsy

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Purpose: To assess the effect of the duration of epilepsy, or earlier surgery, on the outcome of epilepsy surgery in cavernomas-related refractory epilepsy, we designed a cohort study and analyzed the long-term surgery outcomes.
Method: 63 patients with refractory epilepsy due to intracranial supratentorial cavernomas were recruited and analyzed on the duration of epilepsy, epileptogenesis sitations, and epileptic seizure types. All patients underwent extended lesionectomies, and then followed up for at least 2 years. The long-term surgical outcomes were compared between the patients with shorter duration of epilepsy(< 5 years) and the longer ones (> 5 years) by using Kaplan-Meier curve analysis.
Results: The mean duration of epilepsy was 4.5 years, ranged from 3 months to 25 years. The number of patients whose epileptogenesis sitation from temporal lobe was 43, comparing frontal 12, parietal 3, occipital 1, cingulate gyrus 1, and multiple lobe 3. The duratins of epilepsy in 38 patients were shorter than 5 years, and in 25 patients longer than 5 years. At 2 years follow-up, 71% patinets achieved ILAE class 1 outcomes, and 81% for ILAE class 1&2 outcomes(seizure free). The seizure free rate of the early surgery group (duration of epilepsy < 5 years) was 92%, better than the rate (56%) of the delayed group (duration of epilepsy > 5years), p< 0.01.
Conclusion: Early resection of supratentorial cavernomas is associated with a higher rate of postoperative seizure freedom than delayed surgery.

009

Tailored frontal lobectomy after posterior quadrantectomy versus functional hemispherotomy for hemispheric pediatric epilepsy patients

KIM J-S[1], BAI H-J[1], YEOM I-S[1], KIM JH[1], PARK E-K[1], SHIM K-W[1], KIM H-D[2], KIM D-S[1]
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[2]Severance Children's Hospital, Yonsei University, Pediatric Neurology, Seoul, Korea, Republic of

Purpose: To study the outcome of Tailored Frontal lobectomy after posterior quadrantectomy for

hemispheric pediatric epilepsy patients, compare to functional hemispherotomy
Method: A retrospective analysis of the Severance children's hospital's epilepsy surgery database was done in all children who underwent a Functional hemispherotomy (FH) and Tailored frontal lobectomy after posterior quadrantectomy (FLPQ) from February 2006 to December 2012. All patients underwent a delicated pre surgical evaluation. Seizure outcome was used by the Engel's classification. And complication related to surgery were compared with each group. FLPQ group was underwent second staged operations. 1st surgery was performed posterior quadrantectomy (behind motor cortex and temporo-occipital lobe) and subdural grid insertion on the frontal area. After surgery, patients underwent intracranial EEG monitoring using subdural grid for a week. Based on that result, We decided the Frontal resection margin. 2nd stage surgery was Frontal lobectomy along the determined resection margin.
Results: There was 39 patients (50 operation cases including revision of hemispherotomy) in FH group. Epilepsy etiology was due to Lennox-Gastaut syndrome, Rasmussen's encephalitis (RE), Infantile hemiplegia seizure syndrome (IHSS), Hemimegalencephaly (HM), Sturge-Weber syndrome (SWS) and due to post-encephalitis or post-traumatic sequelae (PES or PTS). Seizure control rate of functional hemispherotomy was 85.7% (42/49 cases, Engel classification I, II). 7 patients were inserted shunt after hemispherotomy and 7 patients were in need re-operation due to post- operative adhesion, incomplete disconnection. Another 5 patients were underwent 2nd staged Tailored Frontal lobectomy after Posterior quadrantectomy. 100% seizure control rate was seen in this group. (Engel classification I, II). Just 1 case had post-operative complication, hemiparesis. FLPQ group did not need to sacrify the unilateral motor function.
Conclusion: Tailored Frontal lobectomy after posterior quadrantectomy was shown excellent seizure outcome. This new procedure could be treat the hemispheric epilepsy patient without sacrifice of motor function.

010

The antiepileptic efficacy of anterior thalamic electrical modulation in adult patients with intractable seizures

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Purpose: Many patients with intractable seizures are not eligible for surgical resections for some reasons. Several studies showed that the anterior thalamic stimulation might be an option to prevent or reduce seizures in this group of patients. Our study investigated efficacy of the anterior thalamic stimulation in adult patients with epilepsy.
Methods: Ten patients with refractory epilepsy underwent bilateral stereotactic placement of DBS electrodes into the anterior thalamic nuclei.
Results: There were 4 females and 6 men aged from 29 to 47 years. 9 patients have bilateral epileptic foci in temporal or frontal lobes with unremarkable MRI scan. One patients previously underwent for focal cortical resection with good seizure control for 3 years after the surgery. Mean target coordinates were 3.1 mm anterior, 4.7 mm lateral and 12.2 mm above the midcomissural plane. All cases were done under the local anesthesia. In 9 cases we used the microelectrode recording for electrode placement. The electrode position was confirmed with postoperative MRI scan before the generator implantation. In one patient the right electrode was misplaced by 2.5 posteriorly according to preoperative plane, most probably because of the brain shift after the ventricular puncture. We applied the next parameters of high frequency stimulation - 130 Hz, 5 V, 90-μs pulse-width, cycling 2 min on/2 min off. Treatment showed a statistically significant decrease in seizure frequency, with a mean reduction of 74% (mean follow-up, 21 months). Seven patients have a seizure reduction more than 85%. The worse results were achieved in patient with unilaterally misplaced electrode. The EEG dramatically improved in all patients. No adverse

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effects were observed after DBS electrode insertion or stimulation.
Conclusions: DBS of the anterior thalamus is a comparatively safe procedure and highly effective in patients with medically resistant seizures who are not eligible for resective surgery.

Genetics and populations
Friday 8th August
16:30-17:30
Canary Room, Level 4

011
Novel *SCN3A* mutations in epilepsy patients with febrile seizures and mental retardation
CHEN Y[1,2], LIAO W[1], ZENG Y[1], TANG B[1], SHI Y[1], MENG H[1], XU H[1], MIN F[1], YU L[1], YI Y[1], LI B[1], GUO J[3]
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Purpose: Many mutations of voltage-gated sodium channel *SCN1A* gene are associated with febrile seizures (FS) related to epilepsies. However, until now only five *SCN3A* mutations have been identified in children with focal epilepsy. In order to validate whether *SCN3A* mutation is associated with FS, we sought to identify additional instances.
Method: We performed *SCN3A* screening in 46 *SCN1A*-mutation-negative epilepsy children with FS. Then we constructed plasmids, heterologously expressed in tsA201 cells, and used whole-cell patch-clamp recording to define biophysical properties of each identified mutant.
Results: We discovered four novel *SCN3A* mutations which were not observed in 206 unrelated healthy individuals. They came from four different patients with the diagnosis were febrile seizures plus (FS+), generalized epilepsy with febrile seizures plus (GEFS+), severe myoclonic epilepsy of infancy (SMEI) and Lennox-Gaust syndrome (LGS), they all had mental retardation (MR) and three had autism. All the mutants exhibited measurable sodium current, but had heterogeneous biophysical phenotypes. N302S displayed depolarizing shift in the voltage dependence of activation and inactivation, and the window current, as defined by the area of overlap between activation and inactivation curves, appeared smaller than wild-type (WT). A463V exhibited greater in peak sodium current densities and persistent sodium current compared with WT. R520T presented depolarizing shift in the voltage dependence of fast inactivation and speeding up the slow inactivation recovery time. D998E displayed depolarizing shift in the voltage dependence of activation and slow inactivation, while persistent sodium current increased.
Conclusion: We identified four *SCN3A* mutations associated with FS and MR in epilepsy children, and indicated that *SCN3A* is an etiologic candidate underlying a variety of childhood epilepsies and expanded the genetic profile of seizures. Different electrophysiologic properties of mutant channels might play an important role in the phenotypic variations among the patients.

PLATFORM SESSION ABSTRACTS

012

HLA-A*2402 as a common genetic risk factor for aromatic antiepileptic drugs induced Stevens-Johnson syndrome and toxic epidermal necrolysis in Han Chinese

MIN F-L[1], SHI Y-W[1], ZHOU D[2], ZHOU J-H[3], HU X-S[3], HE N[1], QIN B[4], KWAN P[5], LIAO W-P[1]

[1]Institute of Neuroscience and the Second Affiliated Hospital of Guangzhou Medical University, Guangzhou, China, [2]Department of Neurology, West China Hospital, Sichuan University, Chengdu, China, [3]Department of Neurology, Guangdong 999 Brain Hospital, Guangzhou, China, [4]Guangdong General Hospital, Guangdong Academy of Medical Sciences, Guangzhou, China, [5]Departments of Medicine and Therapeutics; †Anatomical and Cellular Pathology, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong, China

Purpose: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are rare but severe cutaneous adverse reactions caused by a certain number of medications including antiepilepti drugs(AEDs) carbamazepine (CBZ), lamotrigine (LTG) and phenytoin(PHT). Although a strong association between CBZ-SJS/TEN and HLA-B*1502 has been found in Han Chinese, several studies suggest other HLA alleles maybe a genetic factor for AEDs-SJS/TEN. We thus investigated the involvement of HLA-A, B, C, DRB1 alleles in CBZ-, LTG-, and PHT-SJS in Han Chinese.

Method: We performed a case-control study. The HLA-A, B, C, DRB1 genotyping were performed on 74 AEDs-SJS/TEN patients (44 CBZ-SJS/TEN, 17 LTG-SJS and 13 PHT-SJS), 194 AEDs-tolerant subjects (108 CBZ, 46 LTG and 40 PHT) who were on the culprit drug for more than 3 months without the adverse reactions and 5270 healthy volunteers.

Results: HLA-A*2402 was significantly associated with the three drugs (CBZ, LTG and PHT) induced SJS/TEN. The HLA-A*2402 was present in 14 out of 44 (31.8%) CBZ-SJS/TEN ($p = 0.04$), 8 out of 17 (41.7%) LTG-SJS ($p = 0.01$) and 6 out of 13 (46.2%) PHT-SJS patients ($p = 0.03$). The presence of HLA-B*1502 in CBZ-SJS/TEN (31/44, 70.5%) was significantly higher than that in CBZ-tolerant controls (20/107, 18.9%) ($p = 9.88\times10\text{-}10$), but not significantly different in LTG-SJS ($p = 0.53$) and in PHT-SJS ($p = 0.2$). In addition, HLA-C*0801, HLA-DRB1*1202 and DRB1*1454 also showed an association with CBZ-SJS ($p = 1.18\times10\text{-}8$, $p = 0.02$, $p = 0.006$), HLA-A*0201 associated with PHT-SJS ($p = 0.04$). On the other hand, the presence of HLA-A*3303 and HLA-Cw*0302 was significantly lower in CBZ-SJS group than in CBZ-tolerant controls ($p = 0.01$, $p = 0.03$).

Conclusion: Our results indicate that HLA-B*1502 as a specific risk allele for CBZ-SJS/TEN, while HLA-A*2402 may be a potentially common risk allele for CBZ-, LTG- and PHT-SJS in Han Chinese.

013

Multiplex families with epilepsy: a clinical and molecular genetic study of 211 families

AFAWI Z[1,2], OLIVER KL[3], KIVITY S[4], MAZARIB A[5], BLATT I[6], NEUFELD M[5], KORCZYN A[2], BERKOVIC SF[3], ISRAELI COLLABORATIVE PROJECT

[1]Zlotowski Center for Neuroscience, Ben-Gurion University, Beer-Sheva, Israel, [2]Sackler School of Medicine, Tel-Aviv University, Ramat Aviv, Tel-Aviv, Israel, [3]Epilepsy Research Centre, University of Melbourne, Austin Health, Heidelberg, Melbourne, VIC, Australia, [4]Epilepsy Unit, Schneider Children's Medical Center of Israel, Petah Tiqvah, Israel, [5]Department of Neurology, Tel-Aviv Sourasky Medical Center, Tel-Aviv, Israel, [6]Department of Neurology, The Chaim Sheba Medical Center, Tel Hashomer, Israel

Purpose: Discovering the genetic basis of the common epilepsies is a major priority in epilepsy research. In order to enrich for genetic causation, yet avoiding the selection of only large Mendelian families, we studied the clinical and inheritance patterns of multiplex families in Israel; an ethnically heterogeneous but geographically small country with high quality medical services.

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Method: Following the referral of families with two or more individuals with epilepsy to the project, individuals were classified into epilepsy syndromes. Familial epilepsy classification was possible following the successful classification of at least two family members. Pedigrees were analysed and molecular genetic studies were performed as appropriate.
Results: 211 families were studied. We successfully classified 169 families into broad familial epilepsy syndrome groups; 69 Generalized, 22 Focal, 24 GEFS+, 32 Special and 29 Mixed. 42 families remained unclassified.
Arab families made up 25% of our cohort with the remaining families Jewish (44% Sephardic, 23% Ashkenazi, 8% mixed Jewish). Arab families were disproportionately represented in our Special familial syndrome group and were more likely to be consanguineous.
Molecular lesions were identified in 47/211 families (22%). The majority were found in established epilepsy genes *(e.g., SCN1A, KCNQ2, SLC2A1)* but in ten families, this cohort contributed to novel genetic discoveries *(e.g., KCNT1, PCDH19, TBC1D24)*. Unexpected findings include the discoveries of dominant *SCN1A* mutations in two families with focal epilepsy and a homozygous *LAMC3* mutation in a consanguineous family where the predominant phenotype was epilepsy with myoclonic-atonic seizures; these observations expand the phenotypic spectrum of these epilepsy genes.
Conclusion: 80% of families were successfully classified with causative mutations identified in 22%. The successful characterization of familial electro-clinical and inheritance patterns here has highlighted the value of studying multiplex families and their contribution towards uncovering the genetic basis to the epilepsies.

014

Somatic activating mutations in mTOR cause focal cortical dysplasia

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[1]Yonsei University College of Medicine, Seoul, Korea, Republic of, 2KAIST, Seoul, Korea, Republic of

Purpose: Focal cortical dysplasia type II (FCDII) is a developmental malformation of cerebral cortex and an important cause of medically refractory epilepsy. FCDII sporadically occurs, and this condition is characterized by dysmorphic neurons and disrupted cortical lamination in affected cortical regions. It has been hypothesized that FCD is caused by somatic mutations in affected regions. However, no such mutations have been identified. Here, we reported de novo somatic mutations of MTOR in the affected brains of FCDII patients.
Method and result: Deep whole exome sequencing of paired brain--blood DNA from 4 FCDII patients revealed brain somatic mutations in 3 patients including MTOR c.4448G>A (p.Cys1483Tyr), MTOR c.7255G>A (p.Glu2419Lys) and c.7280T>C (p.Leu2427Pro). We also performed deep targeted sequencing of the codons encoding mTOR p.Cys1483, pGlu2419, and p.Leu2427 residues in brain tissues obtained from an additional 76 FCDII patients. In total, We identified 13 FCDII patients carrying somatic missense mutations in MTOR including mTOR p.Cys1483Tyr or Arg, pGlu2419Lys or Gly, and p.Leu2427Pro or Gln, accounting for 16.3% of all FCDII participants (13 of 80). The prevalence of the mutant allele in affected brain tissues ranged from 1.0% to 12.6%. The identified mutations induced the constitutive activation of mTOR kinase and cytomegalic neurons in affected brains carrying these mutations.
Conclusion: Furthermore, the focal cortical expression of MTOR mutants in in-utero electroporated mice was sufficient to interfere with proper neuronal migration and cause spontaneous seizures with epileptic discharge and cytomegalic neurons. Therefore, this study provides the first evidence that somatic activating mutations in MTOR cause focal cortical dysplasia.

PLATFORM SESSION ABSTRACTS

015

The present situation of epilepsy in the rural areas of Jilin province and the standardization pharmacal medicine treatment

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[1]First Norman Bethune Hospital of Jilin University, Department of Neurology, Changchun, China, [2]First Norman Bethune Hospital of Jilin University, Department of Emergency, Changchun, China

Purpose: To understand treatment status of convulsive epilepsy in rural areas of Jilin province and the adverse reactions and efficacy of phenobarbital and valproate. To explore how to control the seizures effectively and to reduce the mortality rate in patients with epilepsy and to improve their quality of life.

Method: Selecting rural areas of Jilin province and carrying out rural epilepsy project. Training township hospital doctors to conduct a preliminary screening from the patients who were confirmed or suspected convulsive epilepsy. Then a neurologist in charge of the project reviewed whether they would be included to the treatment management group and administrated to phenobarbital, sodium valproate for free. Then the patients were followed up regularly, and filled out the follow-up tables. The doctor used some softwares to record and analyse the data.

Results: 2192 patients were selected, including 1234 men (56.3%), 958 women (43.7%). The ratio between male and female was 1.29:1. The average age was 41.13±15.187. The patients aged from 0 to 20 years old accounting for 56.6%. There were 1080 active epilepsy patients accounting for 83.1% and the treatment gap accounting for 40.72%. The most common type of attacking is generalized tonic and clonic seizures accountingr 79%. There were 222 epileptic patients quit the group accountingt for 10.1%.

Conclusion: Phenobarbital mild adverse reactions included drowsiness, sleepiness, dizziness and headache. Taking the medicine for one whole year, significant rate: 71.3%, effective rate: 4.9%, total effective rate: 76.2%. Multivariate analysis showed: phenobarbital treatment was a protective factor for final outcome, the strength of the correlation value of OR was 0.376 (95%C.I. 0.216-0.655). The common adverse reactions of VPA were headache, drowsiness, fatigue, nausea and vomiting. The total efficiency rate will be 92.2% after a year. Due to the small sample size, multivariate analysis did not display significant factor.

Epileptogenesis and basic science
Saturday 9th August
15:00-16:00
Waterfront Ballroom, Level 2

016

Temporal differences in microRNA expression patterns in rat hippocampus and cerebral cortex after developmental seizures

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Purpose: Seizures is a common developmental CNS disease, usually associated with impairment in brain functions. MiRNAs play critical roles in the regulation of brain functions and contribute to various pathological conditions. The main objective of the current experiment is to investigate whether miRNAs is involved in the process of brain injury after developmental seizures.

Method and Results: We detected the expression pattern of miRNAs in hippocampus in response to 24 h post-seizures through TaqMan miRNA arrays and further explored specific miRNAs expression in rats hippocampus and cerebral cortex subjected to convulsions. Consequently,

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21 miRNAs were downregulated at least 0.5-folds, while 9 miRNAs were upregulated at least 2.0-folds in hippocampus at 24 h post-seizures. The expression of miR-34b-5p and miR-204 were upregulated at 2-24 h in both hippocampus and cerebral cortex with a different magnitude, followed by downregulation at 72 h-7 d post-seizures. In contrary, miR-672 and miR-582-3p expressions were decreased significantly at 2 h-7 d post-seizures in hippocampus, whereas upregulated in cerebral cortex. Our data also demonstrated strong correlations between miR-34b-5p and miR-204 expression in hippocampus and cerebral cortex at different time-points post-seizures, but the correlation between miR-672 and miR-582-3p were poor. Finally, progesterone intervention led to an elevated expression of miR-34b-5p and miR-204 at the early event of seizures and abolished the decrease of miR-672 after convulsions in two tissues, while increased miR-582 expression significantly at different time-points in hippocampus. Additionally, progesterone inhibited the increase of miR-582-3p and miR-672 at the early stage of seizures in cerebral cortex, but there were no significant effects after 24 h post-seizures.
Conclusion: Seizures-induced brain injury might led to altered miRNA expression patten in a tissue-specific manner, and progesterone might act as an antiepileptic drug through its effect on specific miRNA expressions after recurrent seizures.

017

Inflammatory mediators role in Epileptgenesis caused by Cavernous angioma

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Purpose: We performed tissue immunostaining for iron, oxidant stress and inflammatory mediators using tissues around the cavernous angiomas (CAs) removed during epileptogenic focal excision to further elucidate the mechanism of epilepsy pathogenesis in tissues around CAs.
Method: CAs with surrounding epileptogenic cortical tissues identified by EEG and direct recording in six patients after epilepsy surgery at the Neurosurgery Department of Juntendo University were resected. Fixed in formalin specimens were stained for HE and iron and immunostained for MAP-2, GFAP and CD68 as neuronal, astrocyte and microglia markers, respectively, TLR4, HMGB1 and IL-1β as the inflammatory mediators, and 4-HNE as an oxidative stress marker.
Results: All patients were seizure-free after surgery. Iron staining showed stronger iron deposition around the CAs in three of the six patients. Oxidative stress was confirmed in many sites both with and without strong iron deposition. Amount of reactive astrocytes (gemistocytes) and microglia phagocytizing iron was increased in areas of strong iron deposition, as indicated by the expression of HMGB1 and TLR4. Furthermore, there were neurons showing HMGB1 and TLR4 expression located far from the angioma. Throughout the brain cortex, IL-1β expression was confirmed. However, even in tissues without strong iron deposition, HMGB1 and TLR4-positive astrocytes, microglia and neurons were confirmed.
Conclusion: Oxidative stress and inflammatory mediators were confirmed throughout ECoG identified epileptogenic brain cortex around CAs, as by, suggesting a relationship with epilepsy pathogenesis. Clarification of the role of these mediators in epileptogenesis might improve the definition of the limits of epileptogenic cortical areas and precise cortical resection in epilepsy surgery.

PLATFORM SESSION ABSTRACTS

018

HHV-7 in adults with drug-resistant epilepsy: a pathological role in hippocampal sclerosis?

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[1]West China Hospital, Sichuan University, Department of Neurology, Chengdu, China, [2]West China Hospital, Sichuan University, Chengdu, China

Purpose: Human herpesvirus-7 (HHV-7) is a β-herpesvirus associated with febrile seizures. No association between HHV-7 and epilepsy has been confirmed. The objective of this study was to investigate the presence of HHV-7 protein (KR4) in brain tissue from patients with drug-resistant epilepsy, and to determine whether inflammatory molecules are activated with the presence of HHV-7 infection.

Methods: We used immunohistochemistry (IHC) to detect HHV-7 protein KR4 in samples from 305 patients with drug-resistant epilepsy. Liquid nitrogen-preserved hippocampal sclerosis (HS) samples from 63 of them were available and we used nested polymerase chain reaction (PCR) to detect HHV-7 DNA. Inflammatory molecules including Tumor Necrosis Factor-alpha (TNF-β), Transforming Growth Factor-beta (TGF-β), Interleukin-1 (IL-1) and Interleukin-6 (IL-6) were identified by real-time PCR (rt-PCR) and IHC.

Results: There were 201 males. Mean age was 23.9, SD 6.2 years (range 15 to 45). HS was the pathology in 69 (23%). HHV-7 protein was detected in 27 (9%) of the 305 samples and in none from 42 controls. Factors associated with HHV-7 infection were HS (11/69), glial scar (8/58), arachnoid cyst (2/21), focal cortical dysplasia (2/31) and vascular malformation (4/52). HHV-7 antigen was distributed mainly in cytoplasm of astrocyte and oligodendrocyte in HS samples. HHV-7 DNA was detected in 20 of the 63 nitrogen preserved HS samples. The expression of TGF-β was up-regulated in samples positive for HHV-7 protein, with distribution mainly in neurons.

Conclusion: This suggests a possible association between HHV-7 positivity, activation of TGF-βand drug-resistant epilepsy, especially HS but this needs replication.

019

Fasudil ameliorate the severity of lithium-pilocarpine induced status epilepticus in rats

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Purpose: Our study aimed to determine the effects of the Rho-kinase inhibitor, fasudil, on seizures in lithium chloride-pilocarpine induced temporal lobe epilepsy (TLE) model and further explore the underlying mechanism.

Method: 60 male rats were divided into four groups: (1) SE (n=15) (positive control) presented "status epilepticus" (SE) induced by pilocarpine; (2) SE -fasudil (n=15); received 10 mg/kg fasudil i.p. treatment; 12 hours before and after the injection of pilocarpine, presented SE; (3) saline- control(n=15) (negative control) received only saline solution; (4) control-fasudil (n=15); received 10 mg/kg fasudil i.p. treatment; 12 hours before and after the injection of saline. The animals were monitored by a video system. Duration of myoclonic jerks, clonic and tonic convulsions, tonic hindlimb extensions and percentage of tonic convulsion index, as well as recovery latency and duration of attack were investigated. EB dye and brain weighed method were used to assess encephaledema, which reflex the blood brain barrier integrity. The expression of tight junction protein was determined by western blot.

Result: Compared to saline-control group, the SE group had higher brain water content and intracerebral EB penetration at 24h after induced seizures ($P<0.01$, $P<0.05$, respectively). SE -fasudil group presented significantly decreased spontaneous seizures and shorter duration of attack as well as significant lower brain water content and intracerebral EB penetration

PLATFORM SESSION ABSTRACTS

compared to SE group(P<0.05). Tight junction protein claudin-5 expression in hippocampus was significantly increased in SE -fasudil group compared to the SE group, which was significantly lower in SE group than saline- control (P<0.05).
Conclusion: The Rho-kinase inhibitor, fasudil, may have the protective role in lithium chloride-pilocarpine induced temporal lobe epilepsy rats. Blood brain barrier integrity may be the protective target of fasudil. Our study indicates the potential of fasudil for clinical use.

020
Actions of dehydroepiandrosterone (DHEA) on experimental model of post-traumatic epilepsy: effects on electroencephalography, cognition, glutamate levels and Na^+ K^+ -ATPase activity
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Purpose: Neuroactive steroids are important in the physiology and pharmacology of epileptic disorders. Iron induced epileptogenesis is mediated by oxidative stress. With age decline in levels of DHEA is reported and decrease of DHEA is linked to the development of several neurological diseases. Our aim in this study was to see the effect of DHEA in post-traumatic epilepsy related alteration in EEG, cognitive and biochemical parameters.
Method: To determine the effect of DHEA treatment on above mentioned parameters, male wistar rats of 6-7 months of age group were used. Intracortical injection of FeCl3 (100 mM/ 5µl/5 min) were given to induced epilepsy. Intraperitonial injection of DHEA (30 mg/kg/day) was give for the duration of 7, 14 and 21 days in epileptic rats. Observations were made on epileptic seizure activity in the experimental model of iron-induced chronic epileptogenic foci in rat brain. Cognitive-behavioral parameters were studied by using Morris water maze test. Glutamate levels and Na^+ K^+ ATPase were measured in the tissue homogenate.
Results: DHEA (30 mg/kg/day) administered for 7, 14 and 21 days to epileptic rats prevented the epileptiform electrophysiological activity. DHEA also prevented epileptiform activity-related behavioral alterations studied by Morris water in epileptic animals. DHEA significantly increased Na+ K+ ATPase activity in cortex by 21 % (7 day treatment), 26 % (14 day treatment) and 33 % (21 day treatment) after DHRA treatment for 7, 14 and 21 days. Glutamate levels were increased in epileptic rat brain cortex and after DHEA treatment for 7, 14 and 21 days it was decreased by 9.8 %, 20.9%, 27 % respectively.
Conclusion: DHEA suppresses iron-induced experimental seizure activity, and counter cognitive deficits along with glutamate levels and Na+ K+ ATPase activity. DHEA could be an antiseizure compound to be used clinically to inhibit the vulnerability and severity of post-traumatic seizures.

Presurgical evaluation and surgery
Saturday 9th August
15:00-16:00
Canary Room, Level 4

021
Validity evaluation of [11C]-Verapamil PET in patients with intractable epilepsy
SHIN J-W[1], MOON J[1], LEE S-T[1], JUNG K-H[1], SUNWOO J[1], BYUN J-I[1], CHU K[1], LEE SK[1]
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Purpose: The major hypothesis explaining drug resistance epilepsy is overexpression of p-glyco-protein at the target lesion. But there is no surrogate marker that can quantify the expression of

P-glycoprotein. Here, we use a novel non-invasive [^{11}C] verapamil Brain PET and SPAM analytic method as a surrogate marker for quantifying the expression of p-glycoprotein.
Method: To estimate the expression of P-gp in blood brain barrier and brain parenchyma, [^{11}C] -verapamil PET scan was performed in healthy subjects and patients with epilepsy. While P-gp inhibitor was infused, PET scans were done using [^{11}C]Verapamil, a substrate of P-gp, and to evaluate the expression of P-gp, the SUV of [^{11}C]Verapamil in the brain was quantified. To quantify the SUV of ^{11}C-verapamil we divided the brain parenchyma to 98 region of interests (ROIs) and performed SPAM analyze using SPM software program. Healthy volunteers, patients with drug resistant or sensitive epilepsy were conducted using [^{11}C]Verapamil PET. We compared the whole brain SUV in each group and the asymmetric index calculated by the SUV of ipsilateral areas and contralateral areas.
Results: We completed analyses in 20 patients with epilepsy and 10 healthy controls. In the Drug resistant epilepsy group, 5 of 8 patients had a significantly larger extent of asymmetry between ipsilateral and contralateral areas compared to healthy controls. In the Drug sensitive epilepsy group, there was no significant difference with healthy controls. From the results achieved so far, we confirmed importance of p-glycoprotein expression in drug resistant epilepsy by a noninvasive method. [^{11}C]Verapamil PET can be used as a surrogate marker of p-glycoprotein expression in patients with epilepsy.
Conclusion: [^{11}C]Verapamil PET will be used as a surrogate marker of P-gp expression in patients with epilepsy, and will be an important prognostic factor of individualized drug therapy.

022

Determination of language dominance using Shiritori (last and first) loaded f-MRI: comparison with propofol Wada test

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Introduction: In the brain surgery, prediction of language dominant hemisphere is important because it affects surgical approach and surgical result. Wada test is a reliable method for this purpose, and fMRI by several different tasks also has high concordance rate with Wada test in detection of language dominancy. “Shiritori” is popular Japanese word game (last and first), and we verified the availability of Shiritori task-fMRI to determine the language laterality.
Material and method: Seventeen healthy adults and 28 patients with epilepsy were participated in this study. We use “ Shiritori” as fMRI task. FMRI data was analyzed using SPM8. Language laterality was determined using Laterality Index (LI). We compared LIs of Broca ROI: Broadmann’s area (BA) 44 + 45 and Wernicke ROI: BA 21 + 22 + 37 + 39 + 40. All of epilepsy patients had Wada test using propofol for pre-surgical evaluation.
Results: All healthy adults were right-handedness, their Shiritori task-fMRI significantly activated left BA44+45. In 27 of 28 (96%) epilepsy patients, it also well activated in BA44+45. Wernicke ROI did not show significant laterality. Language dominant hemisphere detected by using LI of Broca ROI corresponded with propofol Wada test in 24 of 27 (88%) patients with epilepsy.
Conclusion: LI is useful to detect language laterality. Broca ROI in fMRI has high concordance rate with propofol Wada test. Shiritori is a useful fMRI task to determinate language dominancy.

PLATFORM SESSION ABSTRACTS

023

Definition of a stereotactic 3D model of the human insula for neurosurgical approach (epilepsy and stereotaxic surgery)

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Purpose: Design a method for 3D reconstruction of the insula, including its gyri and sulci, in AC-PC reference usable individually for imaging or for epilepsy and stereotactic surgery.
Materials - Methods: Morphometric study using 56 MRI of normal insular region. 26 male/30 female, 28 left/28 right hemispheres.
Stage 1: Reconstruction in AC-PC reference of the insula from 3D-T1-MRI slices 1 mm thick.
Stage 2: Digitalization and superposition of data in 3D using PhotoStudio software (Photo Editing Software) system with PC as the center of coordinates.
Stage 3: MATLAB software (Mathworks Inc.) was used to transform in color values each pixel to obtain a color scale corresponding to the probability of insula sulci localization between 0% and 100%.
Results: Demonstration of very significant correlations between the coordinates of the main insular structures (angles, sulci..) and the length of AC-PC (Spearman r = 0.5; two-tailed P = 0.0001).
This close correlation allows to describe a method for 3D reconstruction of the insula on MRI slices that requires only the positions of Ac and PC and then the inter-commissural (AC-PC) length. This procedure defines an area containing insula with 100% probability.
Conclusion: 3D reconstruction of insula will be potentially useful for:
1. To improve localization of cortical areas, allowing to differentiate insular cortex from opercular cortex during stereoelectroencephalographic exploration of patients with epilepsy (SEEG) or in morphological and functional imaging.
2. For microsurgical approach of Insula using Neuronavigation techniques.
3. Identification of Insula during stereotactic surgery (SEEG, biopsy).

024

Mapping interictal high-frequency oscillations (60~500 Hz) in human neocortical epilepsy with intracranial macroelectrodes

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Purpose: Clinical utility of interictal high-frequency oscillations HFO in cases of neocortical epilepsy, is less explored. We investigated the usefulness of HFO in patients with neocortical epilepsy.
Method: We included 15 patients with epilepsy. All patients suffered from neocortical epilepsy and underwent intracranial EEG monitoring for surgical treatment. Total one hour of interictal data, sampled at 2kHz with 0.05~500 Hz filter setting, were obtained during sleep and analyzed with semi-automated detection procedure.
Results: A total of 1,149 electrodes (mean 81 per patient) were analyzed and 20,346 of fast ripples (FR, 200~500 Hz) and 56,844 of ripples (R, 60~200 Hz) were detected. FR event rates in seizure onset zone (SOZ) were higher than other regions significantly in seven. R event rates in SOZ were increased significantly in six patients. Eleven patients showed significant increase or increasing trend of either FR or R in SOZ. Extending the comparison to the irritative zone (IZ), fourteen patients showed significant or marginal increase of either FR or R compared to

control regions. High-rate FR and R regions were identified using individually tuned threshold. In all patients, some HFO were simultaneously detected on two or more contacts, suggesting synchrony during neocortical HFO can span several centimeters by cortico-cortical connections. Seizure-free patients are likely to have more high-rate HFO regions removed compared to patients with remaining seizures. Moreover, failure of removing at least one highly active HFO-generating tissue tend to result in poor outcome.
Conclusion: The present study suggests that relative increase in the event rate of HFO is a potential electrophysiological marker of epileptogenicity in neocortical epilepsy, and surgical removal of highly active HFO-generating regions correlates with favorable surgical outcome. Mapping interictal HFO may have significant clinical significance during pre-surgical evaluations and its findings may be useful in decisions on surgical resection.

025

Spatial congruence of magnetoencephalography spike dipoles for focal cortical dysplasia

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Purpose: To investigate the spatial congruence between magenetoencephalography (MEG) spike dipoles and the location of focal cortical dysplasia (FCD), we analyzed the distribution of MEG dipoles in comparison with location, size and depth of the FCD.
Method: We retrospectively analyzed 14 patients (9 males; mean, 9.5 years; age ranging, 3-17 years) with FCD type II. They underwent 3T MRI, MEG, intracranial video EEG and surgery for intractable epilepsy. We reviewed distribution patterns of MEG dipoles, location, volume and depth of FCD on MRI.
Results: Nine patients had FCD at convexity and five patients had FCD at the bottom of sulcus. In FCD at convexity, the volume of FCD ranged from 2375 to 57331 mm3 (15470±18455 mm3) and the depth ranged from 12 to 40mm (24±10 mm). In FCD at the bottom of sulcus, the volume ranged from 1632 to 4707 mm3 (2922±1177 mm3) and the depth ranged from 23 to 33 mm (27±4mm). Distribution of MEG dipoles for FCD at convexity showed fully concordant in two patients and partially concordant in seven patients with significant spatial congruence when FCD volume is more than 2583mm3. Distribution of MEG dipoles for FCD at the bottom of sulcus showed partially concordant in three patients with poor spatial congruence and discordant in two patients.
Conclusion: FCD volume may need approximately more than 2500mm3 to provide the congruence of MEG dipoles with FCD location. FCD at the convexity showed better spatial congruence than FCD at the bottom of sulcus. There was no correlation between MEG dipoles and the depth of FCD. Spatial congruence between distribution of MEG dipoles and FCD may suggest the correlation between neurophysiological and neuroanatomical features of FCD.

Seizure diagnosis and neurophysiology
Saturday 9th August
15:00-16:00
Riverfront Ballroom, Level 2

PLATFORM SESSION ABSTRACTS

026

The role of the direct directed transfer function in identifying the primary epileptogenic zone from generalized sharp and wave discharges in Lennox-Gastaut syndrome

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Purpose: To identify the primary epileptogenic zone via brain connectivity of the generalized sharp and wave discharge in Lennox-Gastaut syndrome (LGS) patients who had the epileptogenic zones removed and those who did not.

Methods: We reviewed Lennox-Gastaut syndrome patients who underwent surgical treatment from 2005 to 2013. We separated them into a group (Group A) who underwent resective surgery for epileptogenic zones (N=12) with good surgical outcome, and a group (Group B) who only underwent corpus callostomy and retained independent bilateral epileptogenecity (N=15). We analyzed the generalized sharp and wave discharge in preoperative electroencephalography to identify the primary epileptogenic areas by using direct directed transfer function- based a multivariate autoregressive model. We compared the areas identified by direct directed transfer function with the resection areas in Group A and with the postoperative EEG in Group B.

Results: The results of direct directed transfer function showed localization or lateralization in 83.3% of Group A, and while bilateral or multifocal localization in 93.3% of Group B ($p< 0.01$). The localization shown by direct directed transfer function included resective areas in all patients and agreed with resective areas in 58.3% of Group A. Among areas identified by direct directed transfer function, frontal area was localized at 91.7% and 100%, while extra-frontal areas were localized at mean 33.3% and 24.5% in group A and group B, respectively. The diagnostic sensitivity of direct directed transfer function for lateralization and localization was 83.3% and 62.5%, respectively, and the specificity was 86.7% and 63.2%, respectively.

Conclusion: Analyzing the generalized sharp and wave discharge by using the direct directed transfer function might be a valuable approach for the identification of the primary epileptic zone in Lennox-Gastaut syndrome, alongside a multimodal approach.

027

A phone App to diagnose epileptic seizures: a useful tool to reduce the epilepsy treatment gap in Asia

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Purpose: If the epilepsy treatment gap in Asia is to be closed then health professionals other than doctors must be involved with epilepsy management. To do this they will need some tools to help them. The diagnosis of episodes of altered consciousness as epileptic seizures is key to epilepsy management. Traditionally done by doctors and time-consuming, this relies on asking questions and analyzing the replies. It should be possible to design a tool to do this using a Bayesian approach enabling the diagnosis to be made by non-doctors. The purpose of this study is to devise and test a phone app to enable non-doctors to diagnose epileptic seizures.

Method: Sixty-seven consecutive patients attending epilepsy clinics at Dhulikhel Hospital, Nepal and its outreach centres were asked a series of 53 questions about their episodes. A diagnosis of "epileptic seizure (E)" or "not epileptic seizure (NE)" was reached clinically. Retrospectively, for each question asked, the Likelihood Ratio (LR) of having E or NE was calculated. The most informative LRs were identified and used sequentially to calculate a probability of an episode

being E. This was incorporated into a mobile phone app which was then validated in different populations in Nepal and India.
Results: Of the 67 patients originally seen, 51 had E giving a pre-test probability of 0.76. Eleven questions had an LR>3 and were incorporated into the app. The app was then validated in 132 patients. Non-doctors were able to use it with minimal training. An app probability of >0.9 was 88% sensitive and 100% specific for those with a clinical diagnosis of epilepsy.
Conclusion: A phone app has been designed to diagnose epileptic seizures and works well in practice. It should be particularly useful to health workers in low-resource settings and may also be useful for epilepsy-inexperienced doctors.

028

Role of short term video electroencephalography with induction by verbal suggestion in the diagnosis of transient unresponsiveness with suspected psychogenic non-epileptiform seizure-like symptoms

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Purpose: To determine the diagnostic yield and utility of short term video electroencephalography [STVEEG] with verbal suggestion in diagnosis of patients presenting with transient unresponsiveness and suspected psychogenic non-epileptiform seizures [PNES].
Methods: A retrospective analysis of all STVEEG records of patients referred to the Neurology and Epilepsy clinic of Shree Krishna Hospital, [a medical college associated rural based teaching hospital in Western India] with transient unresponsiveness and suspected PNES between 1 Jan 2009 to 28 Feb 2014 was done. Patients with definite seizures or syncope were excluded.
Results: Amongst 155 patients [38 male, 117 female], mean age 32[8-67], PNES were identified [by a normal baseline EEG and inducible episode with characteristic semiology and consistent concomitant EEG] in 109 [70.3%], interictal EEG abnormalities consistent with focal epilepsy were identified in 24 [15.4%], actual seizure was recorded in 7 [4.5%]. 9 [5.8%] patients were found to have both epilepsy and PNES. Primary generalized epilepsy was diagnosed in 2[1.2%]. A diagnosis of other paroxysmal non-epileptiform events [tachyarrhythmia and heart block] was done in 3 [1.9%]. A normal EEG and no inducible episode and hence an uncertain diagnosis at the end of STVEEG was seen in only 17 [10.9%] patients. The mean STVEEG recording time was 47[35-75] minutes and a PNES episode could be induced in a mean period of 26 [13-58] minutes post verbal suggestion thus confirming the diagnosis. A STVEEG of approximately one hour duration was able to establish the diagnosis in 138[89.1%] patients with transient unresponsiveness.
Conclusion: STVEEG with verbal suggestion is a useful and cost-effective diagnostic test for diagnosis of PNES. It can be a good modality for diagnosis in patients with transient abnormalities in sensorium in the outpatient settings in developing countries and can greatly reduce the cost involved in the diagnosis of such transient events.

029

Symptomatic epileptic seizure in neurointensive care unit

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Background: Symptomatic Epileptic Seizures (SES) in Neurointensive Care Unit(NICU) represent a difficult problem, because etiology often can not be identified. The aim of the study was to

PLATFORM SESSION ABSTRACTS

establish frequency, pecularities and prognosis of seizure in NICU
Material and Methods: Prospective study of 449 NICU patients with SES was carried out from May 2006 to May 2007.
Results: SES was an initial sign in 24 (24,7%) from 97 stroke patients (38% cases were ischemic,62% hemorrhagic) , in 51(44,7%) from 114 with SAH , in 9(9,1%) from 98 with cerebral tumors, in 15(38,4%) from 39 with brain injury, in 41 (52,5%) from 78 withCNS infections or postsurgical meningitis, in 3(13%)from 23 with metabolic or hypoxic/toxic encephalopathy.
Partial onset with secondary generalization seizures observed in 51(35, 6%) of all 143(31,8%) cases, focal seizures in 42 (29,3%) and general in 50(35,1%) cases. First SES occurred in 72 (16%) and recurrent in 39(8, 6%) of all cases. Statistical analysis revealed that recurrent seizures are higher in patients with ischemic stroke, CNS infections.They had lower Glasgow Outcome Scale, Barthel and Rankin Indexes and no specific EEG features that could predict the recurrence SES
Conclusion: SES is the one of the essential brain damage symptom, which need prompt recognition for the future management to improve patients outcome. The management of the seizures in NICU depended from the specific etiology, time of onset, environment and the additional factors that increase the risk for seizures, including structural cortical injuries and medications, which used in NICU, may be with epileptogenic potential.

030
Lateralizing and localizing signs in children with focal epilepsy
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Purpose: Lateralizing and localizing signs in video-EEG monitoring reflect the symptomatic zone and help define the epileptogenic zone in children with focal epilepsy undergoing presurgical workup. Precise localization permits assessment of suitability for and planning of surgery.
Seizure semiology in pediatric studies demonstrates differences compared to adults, particularly in younger patients. Clinical observation of motor manifestations is not consistently contralateral as adult studies. We studied lateralizing and localizing signs in children with focal epilepsy, to evaluate their utility in lateralizing to the epileptogenic focus.
Method: We reviewed ictal events of children admitted to the KK Women's and Children's Hospital Epilepsy Monitoring Unit for video-EEG monitoring from August 2008 to February 2013. Subjects with refractory focal epilepsy and recorded electroclinical seizures were chosen. Events were compared to EEG onset from clinical EEG records and correlated with MRI and PET scans, where done. Diagnosis and treatment outcomes were abstracted from inpatient and outpatient notes.
Results: We identified 718 videoed events from 89 recordings of 72 patients with focal epilepsy. Average age was 8.89 years (0.48-21.59). Of 71 recordings with epileptic events, 18 (25.4%) localized to the temporal lobe, and 53 (74.6%) were extra-temporal. The most reliable predictors of lateralization ($p < 0.05$) were "Figure of 4" tonic posturing with the contralateral arm extended and the ipsilateral arm flexed (100%), contralateral clonic jerks (98%), contralateral eye version (66%) and contralateral head version (63%). Dystonic posturing, tonic posturing, facial asymmetry and automatisms were non-lateralizing.
Conclusion: Motor signs in childhood were often contralateral in our paediatric population but less consistent than in the adult literature. This could be due to the influence of brain maturation on seizure propagation and the higher prevalence of extra-temporal focal epilepsy in children. Lateralization on clinical semiology alone is insufficient. Further studies including correlation with interictal EEG discharges would be useful.

PLATFORM SESSION ABSTRACTS

Neuropsychology and social
Saturday 9th August
16:30-17:30
Canary Room, Level 4

031

The modifiable psychosocial factors influencing epilepsy care among persons with epilepsy: a cross sectional tertiary care hospital based study

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Purpose: EPILEPSY, poses psychosocial challenge due to chronicity and stigma with treatment gap of 30 to 80%. Patient, physician, treatment related factors may affect seizure control. Global campaign was launched to bring 'epilepsy out of shadows' and reduce treatment gap. The present study was aimed at identifying modifiable factors influencing treatment outcomes among patients with epilepsy [PWE].
Method: Cross sectional study was conducted in 210 PWE at Neurology outpatient. Demographic, epilepsy and treatment data were collected. Assessment of Knowledge Attitude and Practice [KAP] was carried out among PWE and their care takers using questionnaire. Data was analyzed as descriptive measures using SPSS 17.0.
Results: Key findings - 210 PWE, mean age 28.7 ± 15.3 yrs, 120(57.14%) males, 140(66.66%) < 30 yrs, from urban/semi-urban areas, of lower/upper middle socioeconomic status [SES] and education above primary level were enrolled. Responses to KAP questionnaire by PWE revealed 43(20.47%) aware of term epilepsy and 183(87.14%) aware of use of modern medicines for treatment. Responses to cause had 174(82.85%) patients not aware, few considered epilepsy as contagious, mental disorder and hereditary. 108(51.4%) were mentally upset because of epilepsy, 44(21.0%) felt socially isolated and 162(77.14%) not willing to reveal the disorder. Responses by family members showed 192(99.5%) supportive, 178(84.8%) acceptable to leading routine married life and 116(97.5%) confirmed affordability to AED treatment. 50% were unemployed. Respondents to reaction by friends and neighbors to seizure episode in public revealed 72(98.6%) as helpful and 161(77%) acceptable to PWE.
Conclusion: Modifiable factors like - being unaware of cause, social outcast, non-acceptance to revealing disorder, unwillingness to respond to KAP questionnaire do exist and may contribute extensively to treatment gap. A multidisciplinary team to counsel patients, families and public for comprehensive epilepsy care is suggested to help in minimizing this gap and achieving ultimate goal of seizure freedom in PWE.

032

Past and present public familiarity, knowledge and attitudes toward epilepsy in Taiwan

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Purpose: To assess the familiarity, knowledge and attitudes of public toward epilepsy in Taiwan and compare the result of the same study conducted 20 years ago.
Method: A total of 5845 people (2408 males and 3343 females), aged 15 years or more, living in different area of Taiwan were interviewed face-to-face by a member of the survey team from July 1st to July 31st, 2012. The survey consisted of 12 questionnaires constructed in published studies for testing public awareness and attitudes toward epilepsy. Pearson $\chi 2$ tests was used to

PLATFORM SESSION ABSTRACTS

examine differences in all variables between this study and similar survey 20 years ago.
Results: 5,751 subjects (98.4%) who had ever read or heard of epilepsy. 54.7 % believed that epilepsy was caused by brain disease or injury. 90.4% believed that convulsion is the main symptom of an epileptic attack. 80% suggested his family or friend with epilepsy should be treated by a medical doctor.
24% of the respondents objected to having their children associate or at play with child with epilepsy in school. Nearly half of respondents (49%) objected to their children marrying someone with epilepsy. 87% believed that people with epilepsy should be employed in jobs as other persons are, and three-fourth respondents will hire people with epilepsy.
Conclusion: More respondents (98% vs 87%) had read about or heard of epilepsy. More respondents (55% vs 20%) thought that brain disease or injury may be the cause of epilepsy. Fewer respondents (49% vs 72%) would object to their children marrying someone with epilepsy. More respondents (87% vs 49%) believed that people with epilepsy should be employed in jobs as other persons.
This result suggests that the familiarity, knowledge and attitudes of public toward epilepsy in Taiwan are more favorable than 20 years ago.

033

A cross sectional study of the neuropsychiatric profile of children with epilepsy and their siblings using the mini international neuropsychiatric interview for children and adolescents

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Purpose: Childhood epilepsy is a common neurological disorder associated with neurobehavioral problems affecting lives of patients including the family. The objectives of this study were to identify the prevalence and the presence of neuropsychiatric disorders in children with epilepsy and their siblings, and determine if age, gender, type of epilepsy the patient has, and the duration of the disease were predictors for the occurrence of the neuropsychiatric disorders in both groups
Method: Cross sectional study design was utilized to collate data on neuropsychiatric profile of children with epilepsy and their sibling ages 6-17years old at the Child Neurology Seizure Clinic from November 2012 to April 2013 using the Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI KID).
Results: The prevalence of neuropsychiatric disorders among children with epilepsy was 35/102 or 34.3%; among their siblings- 14/102 or 13.7%. Neuropsychiatric Disorders noted in children with epilepsy are Attention Deficit Hyperactivity Disorder (37%), Specific Phobia (14%), Agoraphobia (11%), Dysthymia (9%), Adjustment Disorder (9%), Oppositional Defiant Disorder (9%), ADHD with ODD (9%) and Adjustment Disorder with panic disorder (2%), on their siblings were also Attention Deficit Hyperactivity Disorder (35.8%), Specific Phobia (21.4%), Dysthymia (21.4%) and Oppositional Defiant Disorder (21.4%). The age (pvalue 0.1115) ranging 6-9 years old for children with epilepsy and female gender (pvalue 0.1227) for their siblings were predictors for the presence of neuropsychiatric disorder.
Conclusion: Attention Deficit Hyperactivity Disorder is the most common neuropsychiatric disorder identified in both groups. The younger the patient, the more likely the presence of neuropsychiatric disorder and female siblings tend to present with problems, thus, it is vital to assess the neurobehavioral aspects of both groups in treating epilepsy, so that appropriate pharmacologic treatment and non-medical management can be rendered to these children.

PLATFORM SESSION ABSTRACTS

034

Sleep problems and impact on quality of life in children with epilepsy

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Purpose: To evaluate prevalence of sleep problems and to assess their impact on quality of life in children with epilepsy.
Method: A cross-sectional study between January 2013 and February 2014 was conducted at Department of Pediatrics, Ramathibodi Hospital. Recruited subjects were patients with epilepsy aged 4-18 years. Their medical records were reviewed for demographic data collection. Questionnaires assessing sleep problems, degree of daytime sleepiness and symptoms of sleep disordered breathing were completed by the parents. Validated Thai Quality of life for children (Th-QLC-2) questionnaire was completed by patients and/or their parents.
Results: There were 259 children (129 boys, mean age 137.4 ± 46.8 months) participated in the study. There were 26, 131 and 102 patients categorized into remission, controlled and not-controlled epilepsy group, respectively. Prevalence of sleep problems was 62.1%, but only half of them were aware by the parents. The top-three common sleep problems were insomnia (32.8%), obstructive sleep apnea (OSAS, 23.2%) and excessive daytime sleepiness (EDS, 11.6%). Aged less than 12 years was associated with OSAS whereas polytherapy was associated with EDS. Prevalence of insomnia and EDS were significantly associated with epilepsy severity. Insomnia and OSAS had negative effect on quality of life in both controlled and uncontrolled epilepsy particularly physical, learning and emotional aspects.
Conclusion: Sleep problems are common in children with epilepsy particularly in uncontrolled epilepsy. Quality of life of these children is affected not only by severity of epilepsy but also the presence of sleep problems. Screening of sleep problems in children with epilepsy is highly recommended.

035

Anxiety and depression in adolescents with epilepsy

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Purpose: The present study aims to assess (1) rates of anxiety and depression among a cohort of Chinese adolescents with epilepsy and (2) socio-demographic and seizures-related variables in relation to anxiety and depression.
Methods: Patients aged 10 - 18 years with diagnosis of epilepsy attending mainstream schools were recruited. Hospital Anxiety and Depression Scale (HADS) was used to assess anxiety and depression. Children with anxiety or depression were included as cases and were compared to children without anxiety or depression.
Results: A total of 141 children (72 boys, 69 girls) were recruited. 46 (32.8%) children had anxiety and 31 (22.1%) had depression. Fifteen (10.7%) children suffered from both anxiety and depression. Anxiety and depression are highly associated. Common risk factors for these two affective disorders are frequent seizures at onset and duration of epilepsy. Factors associated with anxiety were: older age (OR = 1.16, 95% CI 1.02, 1.33, P = 0.028) and polytherapy (OR = 2.15, 95% CI 1.26, 3.69, P = 0.005). Seizure free > 12 months was a favorable factor (OR = 0.86, 95% CI 0.3, 2.42, P = 0.012). Factors associated with depression were: medical co-morbidities (OR=4.57, 95% CI 1.81, 11.53, P= 0.001), female gender (OR= 8.86, 95% CI 1.22, 64.06, P= 0.024) and younger age of seizure onset (OR = 0.88, 95% CI 0.79, 0.98, P= 0.016).
Conclusions: A high prevalence of affective disorders was demonstrated in adolescents with epilepsy. A more proactive approach to recognize psychiatric disturbances is required especially

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in those having chronic and severe epilepsy.

Outcomes and neuroimaging
Saturday 9th August
16:30-17:30
Galleria Ballroom, Level 3

036
T2 relaxometry in prognosticating seizure outcome at 6 months in patients with solitary cerebral cysticercosis
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Purpose: Epilepsy following solitary cerebral cysticercosis (SCC) is possibly caused by gliosis in and around the lesion, which would be expected to produce changes in T2-relaxation (T2R) values. This study aims to correlate prospective serial T2 relaxometry with long-term seizure outcome.
Methods: 123 patients with SCC and new-onset seizures were randomised to treatment with albendazole plus antiepileptics (treatment), or antiepileptics only (control), and had magnetic resonance imaging (MRI) scans at 0, 3, 6, 12, and 24 months, which included T2 relaxometry. Prospective follow-up data regarding seizure outcome up to 5 years later were collected.
Results: Clinical and radiologic data of 72 patients were analyzed. T2R values from the lesion centre, wall, perilesional area and normal-appearing adjacent parenchyma fell significantly over time, particularly in the first 3 months. There was no effect of albendazole therapy on T2R values or on seizure outcome. Patients with a good outcome (seizures resolved < 12 months after onset) presented earlier after seizure onset than those with seizures persisting >12 months (1.00±2.18 months versus 5.29±5.43, p< 0.001 by ANOVA). Those who were seizure free 6 months after onset were at a significantly later stage of degeneration at 3 and 6 months (p=0.014 by Mann-Whitney test) and had lower T2R values from the perilesional area and lesion centre on all MRIs. However, seizure outcome parameters were otherwise unaffected by T2R values on serial MRI.
Conclusions: In this serial correlation and outcome study, it was observed that T2 relaxometry at 6 months after seizure onset may help prognosticate seizure outcome in patients with solitary cerebral cysticercosis.

037
Cerebellar white matter changes in partial epilepsy without structural lesions on MRI
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Purpose: We hypothesize that pre-existing susceptible structures in the brain may be associated with the development of partial epilepsy without structural lesions on MRI.
Method: Forty-six patients with partial epilepsy without structural lesions on MRI and 24 normal controls were enrolled for this study. Forty-six patients with epilepsy were consisted of 24 patients with newly diagnosed epilepsy (NDE) and 22 patients with chronic epilepsy (CHE). We analyzed whole-brain T1-weighted MRI using FreeSurfer 5.1. The volumes of the hippocampus and amygdala, thalamus, caudate, putamen and pallidum, brainstem, cerebellar gray and white matter, total cerebral gray and white matter were compared between groups. The statistical significant of p value was set to < 0.004 with multiple correction.

Results: The volume of left thalamus was larger than that of right thalamus in the normal controls (p=0.0001). The volume of cerebellar white matter in patients with partial epilepsy was significantly smaller than that in normal controls (NDE vs normal control, p=0.0019 and CHE Vs normal control, p=0.0001), but there was no difference of the volume of cerebellar white matter between NDE and CHE. In CHE, the volumes of cerebral white matter and left thalamus were smaller than those of NDE (p=0.07 and 0.04, respectively). Furthermore, the volumes of both cerebral white matter and left thalamus were correlated with duration (r=-0.4, p=0.04 and r=-0.4, p=0.04, respectively).
Conclusion: These findings support our hypothesis showing that cerebellar white matter changes may be pre-existing susceptible structures in the brain associated with the development of partial epilepsy without structural lesions on MRI. The volumes of both cerebral white matter and left thalamus may be decreased with process of chronic epilepsy.

038

Adults with a new diagnosis of epilepsy have increased risk of mortality for at least 10 years after diagnosis

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Purpose: We aimed to determine whether patients with a new diagnosis of epilepsy have an increased risk of death, and whether the risk remains elevated over time.
Method: We utilized the First Seizure Clinic patient cohort at The Royal Melbourne Hospital, Victoria, Australia (2000-2009). All N=713 patients newly diagnosed with an epileptic seizure at the clinic were included. Linkage with the National Death Index ascertained those who had deceased. Patient deaths were compared to the Australian age and sex specific rates using Standardized Mortality Ratios (SMR).
Results: The median time post-diagnosis was 4.5 years (range 0.1-11). Linkage with NDI identified 76 patients who were deceased. Epilepsy was the primary cause of death in only 7 cases, and one patient died from a brain tumor. Other causes of death included cancer, respiratory and cardiac conditions. The patient cohort had an all-cause mortality that was more than double what would be expected compared to age and sex specific population rates (SMR 2.2; 95%CI 1.7-2.7). SMRs were increased for all major epilepsy sub-groups (focal, lesion positive SMR 2.1 [95%CI 1.4-3.2], focal non-lesional SMR 1.8; [95%CI 1.2-2.8], genetic generalised SMR 4.2 [95%CI 1.4-13.0], unclassified epilepsy SMR 2.6 [95%CI 1.6-4.0]). SMRs according to follow-up intervals show the risk remains consistently elevated up to at least 10 years post-diagnosis (years 0-1 post-diagnosis SMR 2.2 [95%CI 1.3-3.8], years 1-5 SMR 2.0 [95%CI 1.5-2.8], years 5-10 SMR 2.5 [95%CI 1.6-3.9]).
Conclusion: Patients with newly diagnosed epilepsy have an increased risk of death that is present across all major epilepsy sub-groups and remains elevated for at least 10 years post-diagnosis. Most deaths in this group of patients were not directly related to the epilepsy.

039

Fetal loss patterns in women with epilepsy

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Purpose: To characterize the patterns of fetal loss in women with epilepsy
Method: This study was carried out in the Kerala Registry of Epilepsy and Pregnancy (KREP) where women with epilepsy are enrolled in the preconception phase or in first trimester of pregnancy. The outcome of all completed pregnancies notified under this registry was categorized as fetal loss or live birth.Fetal loss could be spontaneous abortion, induced abortion on fetal or maternal indication, intrauterine death or still birth. The maternal epilepsy characteristics, AED usage and fetal characteristics of the those with fetal loss were compared with those with live births.
Results: During the period 1998 to 2013 there were 2266 registration in this registry, out of which 1711 were completed analysable pregnancies. There were 1557 live birth (91%), 10 IUD or stillbirth (0.6%), 51 induced abortion (3%) - maternal indication 40 and fetal indication 11 and 93 spontaneous abortion (5.4%). There was no significant difference in the fetal loss rates according to the maternal education, maternal occupation or maternal epilepsy syndrome.
Discussion: About nine percent of pregnancies end up as fetal loss under this registry. The lower frequency of spontaneous abortion observed with registration as pregnancy, compared to registrations as preconception is related to the later reporting of pregnancy. The overall fetal loss observed in this study is lower than that reported for community at large and for other hospital based studies on pregnancy outcome
Conclusion: There is no excess fetal loss in women with epilepsy.

040

Long term sequelae of amygdala enlargement in mesial temporal lobe epilepsy

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Purpose: Amygdala enlargement (AE) is reported in early and refractory lesional and nonlesional temporal lobe epilepsy (MTLE). The contribution of AE to the development of intractability of epilepsy is at best uncertain. We aimed to study the course of amygdala enlargement in a heterogeneous group of epilepsy patients with follow-up imaging, clinical profile and seizure outcome.
Methods: Patients were prospectively recruited from adult Calgary epilepsy clinic. We noted the demographic data, epilepsy syndrome, antiepileptic drug profile. Disease course and AE was monitored with follow-up imaging. Pathological diagnosis was determined in those cases who had epilepsy surgery.
Results: Thirty one patients were identified. Mean age of onset of seizures was 32.5 years (4 months to 79 years) epilepsy duration was 13.6 years (1-43). Twenty-two patients had isolated AE and nine had AE and Hippocampal (HC) enlargement. In eight patients who had surgery histopathology showed hippocampal sclerosis (HS) in two, amygdala gliosis in one, cortical dysplasia in one and normal structures in four. On repeat MRI at an average of 11 years (range 1 - 30 years), the enlargement resolved in 7, and persisted in 16. No patient developed further enlargement or malignant features. AED treatment continues in 23/31 patients, 20 on monotherapy. Twenty remain seizure free on average 4 years (1-9 years) of follow-up.
Conclusions: Mesial temporal lobe epilepsy with amygdala or amygdala and hippocampus enlargement may be associated with a favourable prognosis. It is noteworthy that in almost one third cases in which surgery was not performed, there was resolution of the amygdala enlargement. Less than 25% had epilepsy surgery and on pathology the resected lesions were either normal or benign with no tumour. Amygdala enlargement may prove to be a benign subtype of MTLE.

POSTER ABSTRACTS

Adult epileptology

p041

Structure of epileptic seizures in patients with severe traumatic brain injury

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Purpose: To study the structure of ES inpatients with severe traumatic brain injury.
Method: Retrospective analysis clinical and instrumental data and surgical treatment of 1770 operated patients with severe TBI.
Results: ES were seen in 140 patients (7.9%). Men were 86,4 %, women - 13,6%. Immediate seizures (developed within the first 24 hours after injury) were reveal in 114 patients (81.7%), early seizures (in the period from 1 to 7 days after trauma) - 22 cases (15,7 %) and delayed seizures (more than 7 days after trauma) - in 4 cases (2,9%). On the brain computer tomography (CT) in 77 patients with ES (55,2%) were identified subdural hematomas, multiple brain damage (a combination of subdural, intracerebral hematomas and cerebral contusions) were observed in 34 patients (24,3%), intracerebral hematoma and cerebral contusions - in 17 (12,1%) , epidural hematoma - 4 (2,8 %) , depressed skull fractures - in 8 (5,6%).
ES were recorded more frequently in the age group of 41 to 60 years ($p < 0.05$).
Among patients aged 30 years (n = 506) ES developed in 20 cases (3,9 %), from 31 to 40 years (n = 343) - 27 (7,9 %), from 41 to 50 years (n = 356) - 41 (11,5 %), from 51 to 60 years (n = 271) - 32 (11,8 %), from 61 to 70 years (n = 179) - 15 (8,4 %), from 71 to 80 years (n = 86) - 4 (4,7%), older than 80 years (n = 29) - in 1 (3,4%).
Conclusion: ES developed in 7,9 % patients with severe TBI. Most often ES mentioned in patients with: acute subdural hematomas 12,2%, hematomas and cerebral contusions 9,6 % and multiple brain injuries 10,2%.

p043

Practical use of levetiracetam as adjunctive therapy in Japan - interim analysis of drug use-results survey for levetiracetam (E-Keppra® tablet) in adults with partial-onset seizures

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Purpose: To evaluate the safety and effectiveness of levetiracetam as adjunctive therapy for adult Japanese patients with partial-onset seizures (POS) in usual clinical practice.
Method: This was a prospective, open-label, nationwide post-marketing survey targeted to enroll more than 3000 adult patients (16 years and older) with POS. Efficacy measures were the physician-rated global improvement scale (GIS) and proportion of patients with 50%, and 75% and 100% seizure reduction by comparing seizure frequency during 4-week intervals between the pre-treatment period and the last part of the 16-week post-treatment period. Dosage and administration of levetiracetam were based on physician judgment according to the package insert.
Results: Results presented here are from an interim analysis - safety data were available from 1919 patients and efficacy data from 1606. The numbers of concomitant anti-epileptic drugs taken by the 1919 patients when levetiracetam started were 0 (10.68%), 1 (53.31%), 2 (18.24), 3 (11.26%), 4 (4.85%) and 5 or more (1.67%). The incidence of adverse drug reactions (ADRs) was 13.65% (356 events); the most common were somnolence (5.26%) and dizziness (2.08%). Serious ADRs were reported in 25 subjects (1.30%) including four deaths. The cause of the

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deaths and causal relationship with levetiracetam remained unclear, and were therefore handled as ADRs. Improvement rate (improved or markedly improved) as determined by GIS was 80.81% (1238/1532). 100% seizure reduction was observed in 49.45% of patients (720/1456). Greater benefits were seen among the elderly (65 years or older): improvement rate 90.54% (335/370), 50% responder rate 92.77% (321/346), 75% responder rate 88.44% (321/346), and 100% seizure reduction 72.54% (251/346).
Conclusion: Results of this interim analysis indicate that in usual clinical practice in Japan, levetiracetam was an effective option for the adjunctive treatment of adult patients with POS, especially for elderly patients.
Acknowledgment: Sponsored by Otsuka Pharmaceuticals and UCB Pharma, Japan.

p044
Unusual cases of symptomatic seizure
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Purpose: To present two unusual case of symptomatic seizure.
Background: Epileptic seizures are classified as cryptogenic or symptomatic. A cryptogenic seizure is a seizure of unknown etiology, and it is not associated with a previous central nervous system (CNS) insult known to increase the risk of developing epilepsy. Previous studies use the term idiopathic to describe a seizure of unknown etiology. However, the ILAE guidelines discourage use of the term idiopathic to describe a seizure of unknown etiology.
Symptomatic seizure is a seizure caused by a previously known or suspected disorder of the CNS. This type of seizure is associated with a previous CNS insult known to increase the risk of developing epilepsy. Causes of seizures (and sometimes epilepsy) are further divided into **acute** and **remote** causes. This sub-classification depends on whether there is active brain disease (an acute cause) or whether the brain abnormality is the result of an injury caused by a previous event (in which case it would be called remote). For example, if a child with meningitis experiences seizures during the illness, they would be termed **acute symptomatic** seizures. If that same child developed seizures 2 years afterwards, she would be diagnosed as having **remote symptomatic** epilepsy.
In this paper we present two cases of unusual causes of epilepsy: neuroacantosis, hemiplegic migraine.
A 27-year-Old Iranian woman with psychiatric symptoms from 7 years ago because of choreathesosis symptoms was referred from a psychological ward for workup. She had a history of biting the tongue, tics, marked hyporeflexia and lower limb muscle wasting. She had one generalized tonic-clonic seizure attack during admission in the neurology ward.
The other case is a 25 years old woman with right hemiplegia; secondary generalized tonic clonic seizure and left hemispheric swelling and cortical increased hypersignality.

p045
Seizure in Alzheimer disease
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Seizure and Alzheimer disease (AD) are common neurologic disorders that cause frequent problems in elderly patients. Compared with healthy individuals of the same age, patients with sporadic AD have a 6- to 10-fold increased risk of developing clinical seizures during the course

of their illness. Cerebrovascular disease, trauma, tumors, metabolic disorders, drug side effects, infection and the neurodegenerative process itself, are the most common underlying causes of seizure in sporadic AD.
In early-onset familial AD, seizures occur more often than in sporadic AD particularly in patients with the PSEN1 E280A and presenilin 2 mutation and in patients with amyloid precursor protein duplications. Downregulation of the Nav1.1 sodium channel in a subset of GABAergic interneurons and tau-induced hyperexcitability has also been reported as epilepsy causal factors in transgenic mouse models of AD.
Seizures in AD are assumed to be of focal origin because of multifocal nature of pathology but many studies has reported generalized convulsive seizures as the major seizure type. Seizure prevalence seems to increase with AD duration and severity and the recurrence rate is high.
Patients with seizures in the setting of AD are often less responsive to AED therapy. Lamotrigine and gabapentin are the most effective options as initial monotherapy in unprovoked partial-onset seizures. Enzyme-inducing AEDs are not generally recommended due to their increased likelihood of drug-drug interactions and potential side effects. No clear first choice AED exists for initial monotherapy in the case of generalized-onset seizure but the second-generation AEDs are commonly suggested over the older AEDs. The most practical recommendations includes slow titration of an AED with fewest interactions and cognitive side effects to lowest effective dose. Judicious dose adjustment and serum drug level monitoring should be considered as well.

p047

Safety and efficacy of Zonisamide in treatment of partial, generalized or combined epilepsy in Indian adults

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Purpose: The purpose of the study was to evaluate safety and efficacy of Zonisamide in the treatment of partial, generalized or combined seizures in Indian adults.
Method: This prospective, non-comparative, open-label observational study enrolled 655 patients from 30 centres throughout India. Adult patients with partial, generalized/combined seizures received 100 mg Zonisamide once daily as monotherapy/adjunctive therapy for 24 weeks, with 2 weekly dose titration as required. Evaluation was done at 4, 8, 12, 16, 20 and 24 weeks to evaluate safety (adverse events) and efficacy (seizure freedom and responder rate). Efficacy and safety were also assessed using Clinicians Global Assessment of Response to Therapy (CGART) and Patients Global Assessment of Tolerability to Therapy (PGATT) respectively
Results: Out of 655 patients enrolled, 563 completed the study. Zonisamide was used as first line therapy and first add-on in 20.92% and 59.85% patients respectively. A significant decrease in seizure frequency was seen at every follow up visit as compared to baseline ($p < 0.0001$) with maximum change seen at week 24 (mean change from baseline= -3.98, 95% CI -3.39 to -4.57). 24 week seizure freedom and responder rate was seen in 41.22% and 91.15% patients respectively. Total adverse events reported in the study were 115 (17.52%). Discontinuation due to adverse effects of drug was seen in only 0.92% patients. 55.61% patients showed good response (CGART) and 57.32% showed good tolerability (PGATT) to Zonisamide therapy at week 24.
Conclusion: Zonisamide is an effective treatment in partial, generalized as well as combined seizures in adults with a good tolerability profile. No new safety signals were observed.

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p048

Efficacy and tolerability of Zonisamide in partial onset seizures in Indian adults: a sub-analysis

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Purpose: This subanalysis was done to evaluate the efficacy and safety of Zonisamide as monotherapy or add-on therapy in Indian adult patients with partial onset seizures.

Method: This prospective, open-labelled, observational study included 227 adult patients from 30 different sites throughout India. Naive patients with partial onset seizures or already on single or multiple drug therapy, were given 100 mg Zonisamide once daily with dose titration every 2 weeks as monotherapy or add-on therapy for a duration of 24 weeks. Follow up was done at 4, 8, 12, 16, 20 and 24 weeks. Efficacy and safety were assessed by analyzing the seizure freedom and responder rate, and adverse events respectively. Additionally, efficacy and safety were also assessed using the Clinicians Global Assessment of Response to Therapy (CGART) and Patients Global Assessment of Tolerabilty to Therapy (PGATT).

Results: Out of 227 patients, 197 patients completed the study at the end of 24 weeks. 21.15 % patients had simple partial seizures. Responder rate with Zonisamide was shown to be 92.51% with respect to baseline, while 40.53 % patients were found to be seizure free by week 24. No. of adverse events reported during the study was 15.42% (n=35) Adverse events induced discontinuation was seen in only 0.88 % patients. 50.76% and 57.36% patients showed a good response on CGART and PGATT respectively at week 24, thus indicating a good efficacy and safety profile.

Conclusion: Zonisamide is efficacious in adults with partial onset seizures when used as monotherapy or add-on to the other anti-epileptic drugs, with a good tolerability profile.

p049

Efficacy and safety of Zonisamide as 1st add on to existing AEDs in Indian adults with partial, generalized or combined seizures: a sub-analysis

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Purpose: This subanalysis was done to assess safety and efficacy of Zonisamide as a first add on therapy to existing monotherapy in a real world clinical practice setting in Indian adult patients diagnosed with epilepsy.

Method: In this prospective open-label, non-comparative, multicentric, observational study, 392 patients having partial, generalized and combined seizures were treated with Zonisamide (100-500 mg) for 24 weeks as first add-on to the primary antiepileptic drug of clinicians choice. Seizure frequency, clinician´s global assessment of response to therapy (CGART) and patient´s global assessment of tolerability to therapy (PGATT) were assessed every 4 weeks. Primary outcome was reduction in seizure frequency and secondary outcomes were responder rate (>50% reduction in seizure frequency)and seizure freedom over 24 weeks. Adverse events were recorded during the

study period. Change in seizure frequency from baseline was analyzed by Friedman test.
Results: Out of 392 patients enrolled, 350 completed the study. Zonisamide was added to as first add on to monotherapy. Most patients were onvalproate, carbamazepine, Levetricetam or lamotrigine as monotherapy. A significant decrease in seizure frequency was seen at every follow up visit as compared to baseline (p< 0.0001) with maximum change seen at week 24 (mean change from baseline= -4.31, 95% CI -5.02 to -3.59; % Change -93.73%). 24 week seizure freedom and responder rate was seen in 36.73% and 95.15% patients respectively. Total adverse events reported during the study period was 14.80% (n=58) Serious adverse event induced discontinuation was seen in only 1 patient. 52.44% patients showed good response (CGART) and 53.30% showed good tolerability (PGATT) to Zonisamide therapy at week 24.
Conclusion: Zonisamide is effective as first add-on therapy to existing AEDs in treatment of partial, generalized & combined seizures in adults with a good tolerability profile.

p050
Predictors of spontaneous seizure remission in patients of medically refractory epilepsy due to mesial temporal sclerosis (MTS)
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Purpose: To analyze the factors for spontaneous seizure remission for >1 year in patients with drug-resistant epilepsy (DRE) due to mesial temporal sclerosis (MTS).
Method: This analysis included 38 patients with DRE (M:F=20:18, age: 31.7±10.9 years) diagnosed with unilateral MTS (right:left=16:22). Group I (non-surgical/surgery deferred due to remission) comprised of patients with seizure remission (M:F=10:8, age:32.8±12.3 years, mean seizure free period: 2.2±1.1 years; median: 2.1 years). Group II comprised of age and gender matched 20 patients (M:F=10:10, age:30.7±9.7 years) with MTS who never had seizure remission and subsequently underwent epilepsy surgery. Group I and II were compared to find the predictors of the seizure remission.
Results: The age at onset of seizures in group I was 13.2±11.8 years and in group II was 12.0±7.6 years (p=0.71). The duration of seizure was: group I-19.7±12.5 years and group II-19.3±7.7 years (p=0.91). Presence of a psychiatric comorbidity (p=0.05), past history of seizure remissions (p< 0.001), frequent periods of remissions (p< 0.001), first remission within a year of onset of seizures (p=0.02) and normal EEG (p=0.04) were the important predictors of seizure remission in this cohort. Fifteen patients in group I (83.3%) experienced remission following change in AED (p< 0.001), and/or increase in AED dosages (p< 0.001). There was no difference between the two groups regarding the type of semiology (partial vs. generalised) (p=0.28), family history of seizures (p=0.58), side of the lesion (p=0.23), history of febrile seizures (p=0.53) and the number of AEDs (p=0.52).
Conclusion: Seizure free periods in refractory epilepsy is a mystery. The present study unfolds some of the clinically relevant predictors of seizure remission in patients with DRE and MTS. Alteration in the epileptic circuitry by the AEDs or underlying psychopathology might be responsible for such seizure remission periods. Future molecular and network studies are required to understand its mechanism.

POSTER ABSTRACTS

p051

Levetiracetam monotherapy in young female patients with juvenile myoclonic epilepsy

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Purpose: Although valproate is a well-known first-line antiepileptic drug in juvenile myoclonic epilepsy (JME), valproate has a lot of tolerability problems, especially in adolescence and women of childbearing potential. Levetiracetam (LEV) has been reported as one of alternative first-line antiepileptic drugs in JME. We want to describe our experience with LEV monotherapy in young women.

Method: We reviewed medical records of patients with JME treated with LEV monotherapy.

Results: Among 7 young female patients [mean age 21.3 years (18 ~ 27)], LEV was initial monotherapy in 2, second monotherapy in 4, and third monotherapy in 1 patient. Four patients became seizure free and 3 patients had only myoclonic jerks. No patient had significant adverse events. All patients were subscribed as once-a-day schedule and the average daily doses were 678.5 mg (500 ~ 1000 mg). Minimum follow up duration was 18 months.

Conclusion: Our report demonstrates good efficacy and tolerability of LEV in young female JME patients and supports that LEV could be a first-line therapy in JME, especially in women of childbearing potential.

p052

Autism and intellectual disability in Lennox-Gastaut syndrome

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Lennox-Gastaut syndrome (LGS) is an intractable childhood-onset epileptic encephalopathy. Cognitive dysfunction and behavioral impairments are prominent problems in patients with LGS. However, not all patients have intellectual disability (ID), and only a few were reported to complicated with autism especially those with ID. The co-occurrence among autism, ID and LGS remains largely elusive. In this study, we attempted a more detailed analysis of neuropsychological sequelae of children with LGS, to pinpoint distinctive patters associated with this comorbid condition. A total of 50 patients with LGS were enrolled and followed up at least 2 years. The clinical characteristics were analyzed, and evaluations of autism and ID were performed. Seven patients (14%) had normal or borderline intelligence, 86% presented mental retardation (MR). Significant differences in the severity of MR were found between patients with cryptogenic LGS (cLGS) and those with symptomatic LGS (sLGS). In cLGS group, the incidence of normal or borderline intelligence was significantly higher than that in sLGS group (7/28 vs. 0/22, p =0.014), while the incidence of moderate to severe MR was significantly lower than in sLGS group (9/28 vs. 14/22, p =0.027). No autism was found in these LGS people, significantly lower than that in patients with Dravet syndrome (0/50 vs. 9/45, p < 0.001), while no significant difference was found in the severity of MR between the two group. These findings suggest that the complexity of autism, ID and epilepsy may result from multifaceted pathomechanisms.

p053

Comorbidities in Epileptic Patients

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Purpose: Epilepsy was seen at any age and may be together with many systemic, neurological,

and psychiatric comorbidity diseases. In this study, neurological, psychiatric and systemic comorbid conditions were observed.
Method: 3010 patients who were followed up regularly in Ankara Training and Research Hospital Epilepsy Department between January 2012-December 2012 were examined retrospectively. Neurologic, systemic and / or psychiatric comorbidities of patients were reviewed. 258 patients with comorbidity were enrolled in the study. However, 55 patients were not assessed due to insufficient data.
Results: A total of 203 patients were enrolled in the study. After the assessment of the data, neurological, psychiatric and systemic comorbidities were observed in 167, 18, 70 patients respectively. 81 patients had multiple comorbid conditions. The most common neurological comorbidity was mental retardation. When elderly population was considered, the most common neurological comorbid conditions were cerebrovascular accidents (CVA). The most common disease as systemic comorbidity was hypertension. Depression was the most common psychiatric comorbid conditions. During the follow up, 68% (n=38) of patients had seizure free or only aura. AED treatment was changed in 128 patients during follow up. The most common cause of this change was failure in the treatment. Patients 75.9% (n=154) with comorbid conditions cause-effect relationship have been found. The most common cause and effect relationship between epilepsy and neurological comorbid conditions were established.
Conclusion: Epilepsy shows comorbidity with different diseases. Therefore, systemic medications that were used by the patients and comorbid conditions should be taken into consideration when planning the treatment.

p054
Non-stiff anti-amphiphysin syndrome: clinical manifestations and outcome after immunotherapy
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Purpose: Classically, anti-amphiphysin antibody causes paraneoplastic stiff-person syndrome. However, the antibody is responsible for various neurological manifestations, and here we investigated the clinical spectrum of non-stiff anti-amphiphysin syndrome (NSAS) and their responses to immunotherapies.
Method: From October 2012 to March 2014, patients with limbic encephalitis, brainstem encephalitis, cerebellar ataxia, dysautonomia, or polyneuropathy of unknown etiology were screened for classical paraneoplastic or autoimmune synaptic encephalitis antibodies. Patients who are positive for anti-amphiphysin antibody were included and the clinical features, laboratory findings and radiological tests were analyzed.
Results: Total 20 patients had anti-amphiphysin antibody. The most common neurological manifestation was limbic encephalitis (n=10), followed by dysautonomia (n=9), cerebellar dysfunction (n=6), brainstem encephalitis (n=4), peripheral neuropathy (n=3), and myelitis (n=1). Cancer was detected in 7 patients but not in the majority of the patients (mean follow-up period: 2.9 years). Immunotherapy was performed in 13 patients, and most of the patients demonstrated favorable response to the treatment. Intravenous immunoglobulin or steroid treatment was effective in majority of the patients, but 3 patients improved only after rituximab treatment.
Conclusion: Anti-amphiphysin antibody can be detected in non-stiff encephalomyelitis, and is partially associated with cancer. Active immunotherapy improved the symptoms, and novel immune modulating therapies including rituximab might be beneficial to treating the disease.

POSTER ABSTRACTS

p055

Validation of seizure questionnaire in predicting diagnosis and classification

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Purpose: Accurate diagnosis and classification of epilepsy syndrome is vital in clinical practice to guide seizure management and for prognostication. We aimed to determine the clinical features that differentiate seizures from syncope, and focal from generalised seizures.

Method: A 31-item self-administered questionnaire based on Reuten's paper (1992) was developed. A total of 200 patients were recruited from University Malaya Medical Centre, Kuala Lumpur between 2011 and 2013. Statistical correlations with the EEG results and physicians' final diagnosis were made.

Results: 140 patients (73.2%) were diagnosed as having seizure and more than half of the 140 patients (55.7%) had focal seizure disorder, majority being non-temporal lobe epilepsy (41%). Patients with history of childhood seizure, nighttime attacks, absence, uprolling eyeballs, unilateral clonic, vocalisation during attack, tongue biting, urinary incontinence, post-ictal confusion and focal interictal epileptiform dicharges on EEG are more likely to have seizure (P< 0.05). Patients with dizziness, blurred vision, palpitations and normal EEG on the other hand, are more likely to have non-seizure disorder (p< 0.05). Unilateral tonic (OR 5.13), attack in sleep (OR 2.52) and vocali

Results: Fifty-six seizures—22 seizures collected from subdural grids and 34 from depth electrodes—were analyzed. Power spectrogram of frequency band between 0 - 100 Hz demonstrated a significant increase of 10 - 30 Hz frequencies preceding the increase of 30 - 100 Hz frequencies by 3 seconds before propagation in 43 seizures from 12 patients. In each case, the ictal onset was localized to one to two contacts. Focal surgical resections were performed in the areas correlated to the synchronization of these alpha-beta frequencies and HFO prior to and during the patients' clinical seizures. These 12 patients have seizure-free outcomes confirming the localization. In contrast, the alpha-beta frequencies synchronization was not seen in four patients (13 seizures) who did not become seizure-free post-operatively.

Conclusion: Previous studies of HFO from intracranial EEG recordings consistently show the frequencies at ictal onset above gamma range. However, most of these studies utilize microelectrodes and/or single neuron recording techniques. In our study, HFO were preceded by lower frequency activity, and the presence of the lower frequencies synchronization correlated with post-operative seizure freedom. HFO may not be the first ictal manifestation in some cases and lower frequency ictal frequencies should not be overlooked. Larger studies are underway.

p056

Is telephonic follow-up a feasible, effective and acceptable option for epilepsy patients in India? A randomized controlled trial

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Purpose: Periodic follow-up of epilepsy patients is time consuming and costly. Our aim was to test if telephonic follow-ups are feasible, effective and acceptable in 'stable' patients.

Method: Consecutive stable (under follow-up for 6≥months and with a seizure frequency of ≤2 seizures/month) epilepsy patients having telephonic access were randomized into telephonic or in-person follow-up arms. Follow ups were done at 3, 6 and 9 months. The primary outcome was number of breakthrough seizures and the secondary outcome was patient satisfaction at study

completion. Episodes of non-compliance, adverse drug reactions and cost of follow-up in each arm were also noted.
Results: Of 465 patients enrolled, 231 and 234 were randomized into the telephonic and in-person follow-up arms respectively. The study is ongoing and results for 218 and 209 patients in the telephonic and in-person follow-up arms up to 6 month follow-up are presented after accounting for losses to follow-up. Average age is 24.5±11.11 years, 65% are men. Mean time spent for a telephonic follow-up was 3.38 minutes and 78% patients called could be reached in the first attempt. There were 53 and 54 breakthrough seizures in telephonic and in-person follow-up arms respectively (p=0.97). Both arms reported 7 episodes each of non-compliance. Cost of follow-up including wages lost for patient and caregiver, cost of transportation and accommodation during visits were significantly higher for patients in the in-person follow-up arm as compared to the telephonic arm. Acceptability of telephonic follow-up will be assessed at 9 months follow-up.
Conclusion: Telephonic follow up of epilepsy patients is feasible and effective and accompanied by a significant reduction in cost for the patient. Providing an option of telephonic follow-up for epilepsy patients living far from care providers may be considered in routine clinical practice.
We acknowledge the Indian Council of Medical Research, New Delhi for a research grant for the study.

p057
Which frequency comes first in intracranial EEG ictal onset: high or low?
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Purpose: To identify the predominant ictal onset frequencies with wide spectrum EEG frequency analysis.
Method: Sixteen patients with medically refractory focal dyscognitive epilepsy undergoing intracranial macroelectrode monitoring (9 depth electrodes, 7 subdural grids) were analyzed. Digital EEG data was sampled at 2 kHz at various intervals. Multi-band frequency and power analysis were performed to characterize the predominating frequency during the interictal, pre-ictal, ictal, and postictal periods.
Results: Fifty-six seizures—22 seizures collected from subdural grids and 34 from depth electrodes—were analyzed. Power spectrogram of frequency band between 0- 100 Hz demonstrated a significant increase of 10 - 30 Hz frequencies preceding the increase of 30 - 100 Hz frequencies by 3 seconds before propagation in 43 seizures from 12 patients. In each case, the ictal onset was localized to one to two contacts. Focal surgical resections were performed in the areas correlated to the synchronization of these alpha-beta frequencies and HFO prior to and during the patients' clinical seizures. These 12 patients have seizure-free outcomes confirming the localization. In contrast, the alpha-beta frequencies synchronization was not seen in four patients (13 seizures) who did not become seizure-free post-operatively.
Conclusion: Previous studies of HFO from intracranial EEG recordings consistently show the frequencies at ictal onset above gamma range. However, most of these studies utilize microelectrodes and/or single neuron recording techniques. In our study, HFO were preceded by lower frequency activity, and the presence of the lower frequencies synchronization correlated with post-operative seizure freedom. HFO may not be the first ictal manifestation in some cases and lower frequency ictal frequencies should not be overlooked. Larger studies are underway.

POSTER ABSTRACTS

p058

Epileptic seizures in patients during posttraumatic period

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Purpose: Epileptic seizures (ES) are symptoms of irritation in the clinical picture of traumatic brain injury (TBI), and its consequences.
The purpose of the study was to study the structure of posttraumatic epilepsy (PTE) in people who have had traumatic brain injury.
Method: There were 60 patients with PTE, among which there were 45 men (75.7 %) and 15 women (24.3%). Generalized ES was observed in 26 patients (43.6 %) and focal in 34 (56.4 %). Chronologically ES is divided into 4 groups: immediate -developed in the first 24 hours; early - evolved within a week after TBI; deferred - occurred within 6 months after TBI; later - evolved within a period exceeding 6 months after TBI. The EEG revealed foci of epileptic activity in 14 patients which coincided in locations with the structural changes identified by neuroimaging techniques.
Results: Immediate general ES was observed in 7 patients and 5 patients had focal seizures. Early generalized ES was ascertained in 7 patients and focal in 9. Deferred generalized ES was detected in 6 patients and focal in 13. Later generalized ES was ascertained in 6 patients and focal in 8. In the course of antiepileptic treatment decrease in frequency of ES was observed in 55 (92 %) patients. Pharmacoresistance was detected in 11 % of patients.
Conclusion: Thus, PTE in the majority (70.7 %) first time occurred in the interim and acute period of traumatic brain injury, and only 30.3 % of the victims during the long term TBI. In 50.9 % of the affected ES became a sign of PTE development in the long term traumatic disease of the brain.

p059

Epilepsy in patients with stroke

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Purpose: One of the main causes of epileptic seizures in the elderly is a stroke. Stroke and epilepsy are the most common neurological diseases. Epileptic seizures after stroke significantly complicate the recovery period.
The purpose of the study was to examine the state of nitric oxide (NO) in the cerebrospinal fluid of patients with stroke.
Method: 306 patients with acute stage of ischemic stroke were observed. 22 (7.2 %) of them (16 males and 6 females) had convulsions (mean age 62.5). In the cerebrospinal fluid of stroke patients with and without early seizures differences in metabolites NO were observed.
Results: In patients with acute ischemic stroke accumulation of cerebrospinal fluid nitrite during the first day is marked. This phenomenon has been observed neither in patients with early seizures after stroke nor in hemorrhagic stroke. A defect in endothelial nitric oxide synthesis is a feature of stroke patients with epileptic seizures. This may be one of the mechanisms of epileptic seizures in stroke.
Conclusion: Stroke (hemorrhagic) is a major cause of seizures and epilepsy in the elderly. Accumulation in ischemic stroke NO has a protective and vasodilatation effect in relatively small hearth, while the production of NO in the later periods is accompanied by an increase of neurological deficit.

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p060

Epileptical manifestations of long-term functional outcome in case of different stroke subtypes

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Purpose: To determine the influence of post-stroke epilepsy on long-term functional outcome in stroke survivors.

Method: This study is a prospective cohort study among 140 stroke survivors with a first-ever TIA, ischemic stroke, or intracerebral hemorrhagic (ICH) stroke, aged 18 to 90 years. After a mean follow-up of 10 years, we performed a follow-up assessment that included an evaluation for post-stroke epilepsy and functional outcome. Odds ratios for poor outcome on the modified Rankin Scale (mRS) (score>2) and Instrumental Activities of Daily Living (IADL) (score< 8) were calculated using logistic regression analysis.

Results: One hundred twelve patients (80%) with ischemic stroke, 4 patients (2.8%) with TIA, and 28 patients (20%) with ICH developed post-stroke epilepsy. Ischemic stroke patients with epilepsy more often had a poor functional outcome than those without, both on the mRS and IADL (mRS score>2: 24.5% vs. 9.2%, p=0.001; IADL< 8: 28.8% vs. 14.6%, p=0.02). In this case, epilepsy occurred in 24.5% of patients with cardioembolic stroke. Epilepsy was not related to functional outcome in patients with TIA and ICH. Multiple regression analysis revealed that epilepsy was an independent predictor of poor functional outcome after ischemic stroke assessed by mRS (mRS score>2: odds ratio 4.02, 95% confidence interval 1.33-8.60). In contrast, there was no such relation for IADL.

Conclusion: Epilepsy after stroke is a common problem that negatively affects functional outcome, even more than 10 years after ischemic stroke.

p061

Serum natural neurotropic autoantibodies in epilepsy patients

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Purpose: To study the levels of autoantibodies (AAB) to brain proteins-antigens (NF-200, GFAP, BMP, and S100β) in blood serum of patients with idiopathic and symptomatic epilepsies.

Method: We studied 52 patients with epilepsy (main group) at the average age of 36.2±14.7 years old. The main group was divided into 2 groups: I group - 38 patients with idiopathic epilepsy, II group - 14 patients with symptomatic epilepsy. The control group consisted of 16 healthy subjects. Immunological studies were conducted with ELI-Neuro-test by immunoenzymatic analysis. The data obtained were processed using methods of variation statistics.

Results: We observed significant elevation of AAB to protein S100β in epilepsy patients, greater in idiopathic epilepsy, compared to control (54.3±10.3; 39.4±10 and 5.8±1.3 CU, respectively, ð< 0.001). The levels of AAB to MBP were high in the first group (14.9±4.9 CU, ð< 0.001), while in the second group were low (2.6±4.3 CU), in comparison with control (8.0±4.7 CU). The levels of AAB to GFAP were higher in symptomatic epilepsy (13.9±7.9 CU, ð< 0.001). Patients with idiopathic epilepsy had higher (22.0±6.7 CU) levels of AAB to NF-200 vs. patients with symptomatic epilepsy (11.4±6.4 CU) (ð< 0.001).

Conclusion: Thus, all groups of epilepsy patients differed from control group by as individual levels, as degree of deviations of the studied immunological parameters. Early-initiated immunotherapy may improve seizure outcome in such patients.

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p062

A study on clinical, electrophysiological, radiological characteristics of new onset epilepsy in elderly population

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Purpose: The etiology and outcome of epilepsy are related to the age at onset. With increasing age at the time of seizure onset, secondary causes of epilepsy become more prevalent. Because clinical seizure manifestations in the elderly often differ from those in younger adults, they may be difficult to recognize or may be misdiagnosed. Seizures that have their onset in the elderly are symptomatic of an underlying cause, and therefore would have a poorer outcome. Although the incidence of epilepsy in the elderly is high, few studies have looked at the various aspects of new-onset seizures in this age group. Aim of our study is to study the demographic profile, clinical features , semiology of seizures, EEG, imaging characters and treatment aspects offered in new onset of epilepsy in elderly patients.

Method: 229 (out of 390) consecutive patients of elderly age >65yrs with epilepsy who attended Nizam's institute of medical sciences from 2010 (most referred from cardiology after evaluation) are taken. Their demographic features , semiology of seizures, EEG and MRI characters and treatment given are analyzed. Acute symptomatic seizures including pseudoseizures are seen in 48.18% which are excluded.

Results: Mean age of presentation is 68.13 + 3.02years. Most common etiology is ischemic seizures (69.26%) followed by Trauma-Gliosis (14.87%), post tumour epilepsy. Pseudo seizures are found to be in 3.8% of patients. Most common antiepileptic drug (170 out 229) prescribed is still Phenytoin (46.26%). The most common abnormality in EEG is slowing which is either focal or generalized. Spikes are noticed focally mostly in centro parietal region(34.5%).

Conclusion: Elderly patients mostly have ischemic brain lesions as causation of epilepsy. Complex Partial seizures are most common presentation. EEG is non specific with the yield of only 12.66%. MRI brain shows lesion in many cases. Most commonly used drug is still Phenytoin.

p063

Establishing an etiology for medically controlled and refractory focal epilepsy - cross sectional data from an Indian quarternary care teaching hospital

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Purpose: The etiology of epilepsy is the most important factor in prognosis and has a major role in determining the therapeutic approach to the patient. Identification of epileptogenic lesions can change the management by raising possibility for surgery in patients with medically refractory epilepsy; similarly, identifying a genetic syndrome can prevent unnecessary pre-surgical evaluation.

Method: Consecutive patients attending our Neurology outpatients' service with a diagnosis of focal epilepsy were included. Detailed history, physical examination, EEG and MRI brain were prospectively reviewed. In cases with medically refractory epilepsy, the MRI was repeated when required, at our centre and an opinion of an epilepsy neuroradiologist obtained.

Results: A total of 203 consecutive patients (101 refractory - Group 1; 102 controlled - Group 2) were enrolled over a 6 month period. Epilepsy in 94% of the Group 1 patients and 69% of the Group 2 patients, could be assigned a structural cause; hippocampal sclerosis among 28% group 1 and 25% group 2 patients; infective (cysticercal/ tubercular lesions) in 6% of Group 1

and 22% of Group 2 patients; malformations of cortical development in 22% of Group 1 patients and none in Group 2; angiomas(perinatal insults/ strokes) in 20% of group 1 and 5% of group 2, neurocutaneous syndromes, tumors and trauma in the rest. 4% of the patients in the refractory group inspite of having no clearly defined lesion on MRI had a presumed lesion picked up by PET and SPECT. 7% patients in the group 2 had presumed genetically determined epilepsy. 6% patients in the refractory group and 24% patients in the controlled group remained in the epilepsies with unknown etiology group.
Conclusion: Structural etiology is more commonly identifiable among patients with refractory focal compared to those with controlled epilepsy; nevertheless, nearly 6% among the former still have no identifiable etiology.

p064
Early electroencephalography in patients with Emergency Room diagnoses of new-onset seizures: diagnostic yield and impact on clinical decision-making
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Purpose: To assess the diagnostic yield of acute electroencephalography (EEG) performed in the emergency room (ER) and its impact on subsequent management of patients with new-onset seizures.
Adults who completely recover in the ER following isolated new-onset seizures are usually discharged to the neurology clinic for further review. An EEG at that stage may be normal. We sought to assess the yield of early EEG in the ER setting, its impact on management and subsequent seizure recurrence.
Method: A prospective study of patients attending the ER from January 2008 to January 2011 with uncomplicated first episodes of unprovoked convulsive seizures. All patients underwent routine 30-minute EEG in the ER prior to discharge and were reviewed in the neurology clinic within 2 weeks of presentation. Management decisions were at the discretion of the treating neurologist. Seizure recurrence was assessed during a follow up period between 9 months to 3 years.
Results: 136 patients were included in the study (92 males). Mean age was 32 years (range 16-73). 40 (29.4 %) had abnormal EEGs: 16 focal epileptiform discharges, 12 focal slowing, 10 generalized spike-wave discharges and 2 diffuse slowing. On multivariate analysis, patients with abnormal EEG (51 % vs 11%, p=0.003) and abnormal MRI (53% vs 28%, p< 0.001) were more likely to be commenced on anticonvulsant therapy. Higher recurrence rates were observed in the early-treatment group (33% vs 15.5%). Abnormal MRI (p=0.001) was independently associated with a higher risk of recurrence.
Conclusion: Following an ER diagnosis of new-onset uncomplicated seizure, early EEG had a high diagnostic yield. Abnormal EEG and abnormal MRI significantly affected decisions regarding treatment at specialist review. Abnormal MRI was associated with significantly higher risks of recurrence. The recurrence rates in those treated early likely reflects the high-risk nature of this group of patients.

p065
Erythropoietin reduces cytokines secreted by PBMC in idiopathic epilepsy patients
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Purpose: Epilepsy is a chronic neurologic disorder in which cytokines are thought to play a crucial role. Pleiotropic inflammatory cytokines, such as tumor necrosis factor-alpha (TNF-alpha)

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and interferon-gamma (IFN-gamma), play a pathological role in the development of epilepsy and correlate with disease severity. Erythropoietin (EPO), a newly neuroprotective agent, has been reported to suppress epileptic seizures and hippocampal neuronal death in epileptic animal models. However, its mechanism and the effect in epilepsy patients are still unclear. Our preliminary study explored the effects of EPO on peripheral cytokines in idiopathic epilepsy patients.

Method: Thirty-three patients with a diagnosis of idiopathic epilepsy during interictal period (least 7 d from the last seizure attack) were included. Twenty-six age and sex-matched healthy volunteers were included as controls. Both groups excluded subjects with autoimmune diseases, allergic response, immune deficiency disorder, diabetes, psychiatric illness, malignancy, severe cognitive impairment, or a systemic or central nervous system infection. We collected peripheral venous blood and isolated peripheral blood mononuclear cells (PBMC). PBMC was cultured with or without EPO (5ng/ml) for 72h. We measured supernatant TNF-alpha, IFN-gamma, Interleukin-6 (IL-6) and Interleukin-10 (IL-10) levels by ELISA. Cytokine concentrations were compared using non-parametric Mann-Whitney U test and Wilcoxon paired test.

Results: Supernatant TNF-alpha (p=0.000) and IL-6 (p=0.006) levels were significantly elevated in epilepsy patients compared to controls. No difference was found in IFN-gamma and IL-10. In epilepsy patients, EPO could markedly decrease supernatant TNF-alpha (without EPO:349.77[536.94]pg/ml, with EPO:252.62[335.23]pg/ml, Z=-3.100, p=0.002), IFN-gamma (without EPO:146.88[156.48]pg/ml, with EPO:143.98[122.54]pg/ml, Z=-2.153, p=0.031) and IL-10 (without EPO:233.71[800.04]pg/ml, with EPO:178.41[885.39]pg/ml, Z=-2.665, p=0.008) levels, while no significance was found in healthy controls between groups with or without EPO intervention.

Conclusion: EPO may have effect on PBMC resulted the decrease of cytokines secretion in idiopathic epilepsy patients. It predicts a potential clinical use in epilepsy patients.

p066

Quality of life in adults on the ktetogenic diet

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Purpose: The definition of Quality Of Life (QOL) as per World Health Organization (WHO) reflects the view that quality of life refers to a subjective evaluation which is embedded in a cultural, social and environmental context. In some individuals the psycho-social problems may be more debilitating than the seizures themselves.

Ketogenic Diet (KD) which is used mainly in uncontrolled epilepsy has not been widely used in adults and QOL has not been studies in this population.

The aim of the current study is to determine shifts in QOL in adult patients on KD.

Method: The Quality of Life in Epilepsy (QOLIE 31) questionnaire was rated by the patients or caregivers pre and post KD. In addition to epilepsy some of the 15 patients evaluated were also physically and mentally challenged.

Results: In the domains of seizure worry, cognitive function, emotional well being and overall quality of life there have been a marked improvement across most patients.

Conclusion: KD leads to positive gains in QOL in addition to seizure control in an adult population.

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AED issues

p067

Anticonvulsant activity and mechanism of action of ginger (Zingiber officinale Roscoe) rhizomes

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Purpose: Ginger (Zingiber officinale Roscoe.) is used commonly in treatment of many ailments. Ginger contains many biologically active chemical compounds that are known to be important compounds for activation of vanilloid receptors (Vadim N et al. Br J Pharmacol 2002; 137: 793-798). These recently cloned vanilloid receptors and their agonists were reported to be involved in several pathological conditions (Awad E et al. Sudan JMS 2013; 8(4): 175-180; Calixto J et al. Pharmacology and therapeutics 2005;106:179-208).The present study aimed to investigate the potential anticonvulsant activity of ginger extract. Involvement of gamma aminobutaric acid (GABA) and vanilloid receptors in ginger mechanism of action as anticonvulsant were also investigated.
Method: Experimental animal models as maximum electroshock (MES) and pentylenetetrazole (PTZ) induced seizures were used to determine the anticonvulsant activity of ginger. Picrotoxin (noncompetitive GABA antagonist) and capsazepine (vanilloid receptor antagonist) were used to determine the possible mediation of GABA and vanilloid receptors respectively in the mechanism of action of ginger as anticonvulsant.
Results: Ginger extract (400mg/kg) produced 100% seizure protection in MES and PTZ induced seizure animal models. The ED100 of ginger in the previous two models produced 20% seizure protection in picrotoxin induced seizure animal model indicating possible partial involvement of GABA receptors. Capsazepine produced 80% and 60% block to the anticonvulsant activity of ginger on the MES and PTZ seizure animal models respectively, indicating possible involvement of vanilloid receptors.
Conclusion: Ginger represents a potential source for anticonvulsant agents. GABA and vanilloid receptors have a role in the mechanism of action of ginger as anticonvulsant. Vanilloid receptors mediation seems to be a possible new mechanism of anti-epileptic drugs. Crude ginger could be used as potential anticonvulsant agent and/or as co-drug in combination with antiepileptic drugs, especially if further investigations are conducted clinically to explore its possible safety and efficacious use.

p068

Zonisamide, a practical alternative for the treatment of epilepsy. Clinical experiences in Japan

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Purpose: Zonisamide (ZNS), recently available outside Japan, was launched in Japan from 1989, and broadly used for both generalized and localization related epilepsy not only as an additional antiepileptic drug (AED) but also as monotherapy. We tried to elucidate its characteristics concerning the way of administration through our longer experiences.
Method: Subjects were patients who visited to our department from April 2008 to September 2013. We investigated the patients, who were administered ZNS to treat epilepsy, about clinical information such as epileptic syndrome, age at onset, results of therapeutic drug monitoring, number of AEDs used for the patients, seizure control, etc.
Results: Forty-three patients (male:26, female:17, 50.4±20.9 years of age) used ZNS (218.1±103.0mg) for their epilepsy during this period. Thirty-two patients (74.4%) were

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suffering from localization related epilepsy, and the patients with generalized epilepsy or unclassified epilepsy were six (14.0%) and five (11.6%), respectively. In ten patients (23.3%), onset age was under 18 years of age. Mean concentration level in the serum was 14.8±8.4μg/ml. The number of previously tried AEDs was 3.1±1.5, and the number of currently used AEDs was 1.9±0.8. ZNS monotherapy was applied for 12 (27.9%, male;7, female;5, 39.5±19.5 years of age), and eight among 12 (66.7%) obtained seizure freedom over two years (more than 50% seizure reduction; two (16.7%), others; two (16.7%)). Twenty-two patients (51.2%) using ZNS as polytherapy (male;13, female;8, 57.6±20.2 years of age) were also controlled well (seizure free:10 (47.6%), more than 50% seizure reduction; 10 (47.6%), others; one (4.8%)). Ten patients (23.3%) discontinued ZNS because ZNS was tapered off under seizure freedom in four and not effective in six. No major adverse effects occurred.
Conclusion: ZNS was effective for a certain group of epilepsy patients as monotherapy as well as adjunctive therapy. It would be a good alternative especially for young epilepsy patients.

p069

Post marketing surveillance on the use of Zonisamide for epilepsy in the Philippines

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The objective of the study is to monitor on a wide population base the safety and efficacy of zonisamide in patients with partial, generalized, and combined seizures. This is an open label, descriptive, post-marketing surveillance that includes the data obtained from October 2008 to December 2012. The study included 1,073 patients allocated to either zonisamide monotherapy or zonisamide add-on therapy, with efficacy and safety assessed monthly for three months. For adult patients, a maximum oral dose of 600 mg per day was allowed while a maximum dose of 12 mg/kg/day of zonisamide was allowed for pediatric patients. Efficacy measures were the proportion of responders and percentage change in seizure frequency from baseline. 582 of the 1,073 patients were included in the efficacy analysis. The responder rates were 52.92%, 80.07%, and 90.89% after the 1st month, 2nd month, and 3rd month of treatment respectively. The use of zonisamide led to seizure-reduction rates of 41.97%, 67.35%, and 79.95% during the 1st, 2nd, and 3rd month of use respectively. Seizures were not seen in 10.65%, 31.96%, and 53.61% of patients after the 1st, 2nd, and 3rd month of treatment respectively. Safety analysis was done on all the 1,073 subjects. Adverse events were mostly mild and observed in 6.71% of patients. Serious adverse events were encountered in 11 patients on add-on treatment but none among those on monotherapy. Zonisamide as monotherapy or add-on is effective and safe for the treatment of epilepsy.

p070

Post marketing surveillance on the use of Zonisamide as monotherapy for epilepsy in the Philippines

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The objective of the study is to monitor on a wide population base the safety and efficacy of zonisamide in patients with partial, generalized, and combined seizures. This is an open label,

descriptive, post-marketing surveillance that includes the data obtained from October 2008 to December 2012. The study included 518 patients on zonisamide monotherapy, with efficacy and safety assessed monthly for three months. For adult patients, a maximum oral dose of 600 mg per day was allowed while a maximum dose of 12 mg/kg/day of zonisamide was allowed for pediatric patients. Efficacy measures were the proportion of responders and percentage change in seizure frequency from baseline. 219 of the 518 patients were included in the efficacy analysis. The responder rates were 58.45%, 92.69%, and 97.26% after the 1st month, 2nd month, and 3rd month of treatment respectively. The use of zonisamide led to seizure-reduction rates of 51.27%, 78.72%, and 89.50% during the 1st, 2nd, and 3rd month of use respectively. Seizures were not seen in 15.53%, 42.47%, and 68.04% of patients after the 1st, 2nd, and 3rd month of treatment respectively. Safety analysis was done on all the 518 subjects. Adverse events were mostly mild and observed in 5.41% of patients. No serious adverse events were encountered. Zonisamide as monotherapy for epilepsy is effective and safe.

p071

Post marketing surveillance on the use of Zonisamide as add-on treatment for epilepsy in the Philippines

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The objective of the study is to monitor on a wide population base the safety and efficacy of zonisamide in patients with partial, generalized, and combined seizures. This is an open label, descriptive, post-marketing surveillance that includes the data obtained from October 2008 to December 2012. The study included 555 patients on zonisamide add-on treatment, with efficacy and safety assessed monthly for three months. For adult patients, a maximum oral dose of 600 mg per day was allowed while a maximum dose of 12 mg/kg/day of zonisamide was allowed for pediatric patients. Efficacy measures were the proportion of responders and percentage change in seizure frequency from baseline. 363 of the 555 patients were included in the efficacy analysis. The responder rates were 49.59%, 72.45%, and 87.05% after the 1st month, 2nd month, and 3rd month of treatment respectively. The use of zonisamide led to seizure-reduction rates of 36.35%, 60.49%, and 74.18% during the 1st, 2nd, and 3rd month of use respectively. Seizures were not seen in 7.71%, 25.62%, and 44.90% of patients after the 1st, 2nd, and 3rd month of treatment respectively. Safety analysis was done on all the 555 subjects. Adverse events were mostly mild and observed in 7.93% of patients. 11 patients were reported to have serious adverse events. Zonisamide as add-on treatment for epilepsy is effective and safe.

p072

Making epilepsy treatment more affordable: can rationalizing prescriptions reduce cost?

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Purpose: In developing countries like India where neurologists are few and mostly urban, rural epilepsy patients are frequently cared for by primary care physicians (PCP). No 'standardized' prescribing pattern is followed by the PCP. We investigated if an epilepsy specialist could reduce cost of prescription written by a PCP by reviewing the patient and rationalizing treatment in

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accordance with available evidence?
Method: This cross-sectional observational study was conducted on the Lifeline Express, a mobile train hospital which provides several free health services including epilepsy clinics and epilepsy education in rural India. Patients presented in this study were seen at Chatrapur, a rural township in the eastern coastal state of Odisha. Cost of patients' PCP generated prescriptions was first calculated. These patients were then reviewed by epilepsy specialists and if based on their clinical judgment and available evidence specialists decided to change the PCP's prescription, the cost of the new prescription was once again calculated. Prescription changes included: antiepileptic drug (AED) modifications and also stopping any complementary alternative medicines (CAM) and/or supplements that had been prescribed specifically for epilepsy.
Results: Prescriptions of PCP on the whole were found to be significantly more expensive than specialist prescriptions. When the PCP prescription contained AEDs alone, then a specialist review and revised prescription marginally increased the cost. However, a highly significant reduction in cost was brought about by a specialist's review and revision of prescription when CAM and/or supplements had been prescribed with or without AEDs by the PCP.
Conclusion: Cost of epilepsy treatment can be reduced by limiting prescriptions to medicines for which there is evidence. Dietary supplements and CAM add to cost of epilepsy treatment and should be avoided.
Acknowledgements: We acknowledge ICMR research grant to Saloni Kapoor. Priya Jain, Sagun Bajpai, Shelly Gandhi, Sanchit Sharma and CEO Lifeline Express, Dr Rajnish Gourh are also acknowledged.

p073
Validity of polymerase chain reaction (PCR) allele specific test for rapid detection of human leukocyte antigen (HLA)-B*1502 allele status in Singapore paediatric neurology patients
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Purpose: To compare the validity of a PCR allele specific test for rapid detection of human leukocyte antigen (HLA)-B*1502 allele status against the gold standard (One Lambda kit which utilizes a gel electrophoresis technique to capture results) to determine the suitability of its use in a population susceptible to carbamazepine-related severe cutaneous drug reactions. The rapid PCR allele specific test which utilises a colorimetric detection method is a cost-effective and less labour intensive test with a faster turnaround time compared to the One Lambda kit.
Method: The biological samples of blood or saliva obtained were from an original cohort of 32 patients recruited between 1 January 2005 to 31 December 2011 for a case-control study of carbamazepine-induced drug reactions and HLA-B*1502 status. The cases were 22 patients between 1 and 18 years of age with documented allergic reactions to carbamazepine - six were HLA-B*1502 positive. The controls were ten patients who were carbamazepine-tolerant during routine clinical review and nine were HLA-B*1502 negative. Extracted DNA was used to determine HLA allelism with both the rapid PCR allele specific test and the One Lambda kit.
Results: The sensitivity and specificity of both the rapid PCR allele specific test and One Lambda kit were comparable. The turnaround time to reporting for the PCR allele specific test was within 24 hours and the One Lambda kit was 3 to 4 working days.
Conclusion: The PCR allele specific test is a valid and cost-effective testing method for determination of HLA-B*1502 allele status in children who are likely to respond to carbamazepine for the management of their seizures. The implementation of this test in our population will allow for rapid detection of susceptible individuals at risk of carbamazepine-

induced SCDR, and prevent delay in initiation of appropriate drug therapy for the effective management of paediatric epilepsy.

p074

Impact of concomitant antiepileptic drugs on perampanel efficacy and tolerability

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Purpose: To explore the impact of type and number of concomitant antiepileptic drugs (AEDs) on the efficacy and tolerability of adjunctive perampanel for focal epilepsy.

Method: Data were pooled from three Phase III trials of adjunctive perampanel in patients (≥12 years) with refractory partial-onset seizures. Concomitant AEDs were categorized according to whether or not they were enzyme-inducing AEDs (EIAEDs; known to reduce perampanel plasma concentrations) or sodium channel blockers (SCBs). Post-hoc analyses assessed the impact of these categories of concomitant AEDs on changes in seizure frequency, 50% responder rates, rates of treatment-emergent adverse events (TEAEs), and rates of discontinuation due to TEAEs in patients randomized to receive daily placebo or perampanel 2, 4, 8, or 12 mg.

Results: Amongst 1,480 randomized and treated patients, most were receiving two or more concomitant AEDs (n=1273; 86.0%) and most were receiving one or more EIAEDs (n=1083, 73.2%) at Baseline. The magnitude of seizure reduction appeared to be lower in the presence of EIAEDs or multiple AEDs (median change in seizure frequency with perampanel 12 mg plus no EIAEDs, -48.2% [n=62]; plus ≥1 EIAEDs, -16.3% [n=192]; plus one non-EIAED, -46.9% [n=70]; plus three non-EIAEDs, -23.8% [n=55]), and rates of discontinuation due to TEAEs were lower in the presence of EIAEDs (perampanel 2-12 mg plus no EIAEDs, 45/280 [16.1%]; plus ≥1 EIAEDs, 54/758 [7.1%]). Efficacy and TEAE rates did not appear to be affected by the specific presence of concomitant SCBs.

Conclusions: Perampanel efficacy may be reduced in the presence of EIAEDs (due to reduced plasma concentrations) or multiple AEDs (which may be indicative of more refractory epilepsy). Nonetheless, with careful titration to balance efficacy and tolerability, perampanel may be combined with a range of AEDs, facilitating integration into treatment plans.

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p075

The influence of ABCB1 rs2032582 polymorphism on the risk of drug-resistant epilepsy

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Purpose: Pharmacogenetic factors may play a role in drug resistance in epilepsy. Many studies have been focused on ABCB1 rs2032582 polymorphism to explore the association with drug-resistant epilepsy, but these studies have shown inconsistent and conflicting results. We performed this meta-analysis to investigate the pooled association between ABCB1 rs2032582 polymorphism and drug-resistant epilepsy.

Method: We performed a systematic literature search to identify related studies (up to January 2014) in several online databases including PubMed, Google Scholar, the CNKI and Wanfang online libraries. A total of nine studies that including 802 drug-resistant epilepsy patients and 984 drug-responsive epilepsy patients were enrolled in the final meta-analysis. Pooled odds ratio (OR) with 95% confidence interval (CI) was used to assess the strength of the association.

Results: There was a significant association between ABCB1 rs2032582 polymorphism and

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drug-resistant epilepsy in recessive genetic model (OR=1.39, 95% CI: 1.11-1.74, P=0.004). Subgroup analysis by ethnicity suggested that significant association was found in Asian populations (OR=1.41, 95% CI: 1.09-1.83, P=0.008), but not in Caucasian populations (OR=1.32, 95% CI: 0.85-2.07, P=0.220). The sensitivity analysis showed that the results were robust and not affected by any single study with no publication bias.
Conclusion: This meta-analysis suggested that ABCB1 rs2032582 polymorphism might contribute to the occurrence of drug-resistant epilepsy, especially in Asian populations. However, future larger studies with groups of populations should be conducted to validate this result.

p076
Increased homocysteine levels in valproate treated epileptic patients: a meta-analysis
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Purpose: A number of studies assessed the association of plasma homocysteine levels with Valproate (VPA) monotherapy in epileptic patients, but the results were contradictory. We conducted a meta-analysis on studies which compared plasma homocysteine levels of epileptic patients receiving VPA monotherapy with those in controls.
Method: We search all articles in English through PubMed, Web of Science, EMBASE published up to August 2013 concerning the homocysteine levels in VPA monotherapeutic patients with epilepsy. Heterogeneity between studies was assessed using I2 statistics. Pooled standardized mean difference (SMD) and 95% confidence intervals (95% CI) were calculated by using random effects or fixed effect models.
Results: A total of 7 eligible studies were enrolled in our meta-analysis. We compared the plasma levels of homocysteine in valproate treated epileptic patients and healthy controls. There was significant heterogeneity in the estimates according to I2 test (I2 = 66.9%, P =0.006). Plasma homocysteine levels in VPA treated epileptic patients was significantly higher than healthy controls under a random effect model. [SMD, 0.65; 95% confidence interval (CI), 0.30-0.99, P<0.001]. Moreover, in the subgroup analysis based on ethnic, we found that the plasma homocysteine levels is significantly higher in epileptic patients than healthy controls in all subgroups [European group:SMD, 0.87; 95% confidence interval (CI), 0.43-1.32, P<0.001; West- Asian group:SMD, 0.45; 95% confidence interval (CI), 0.08-0.81, P=0.016; East- Asian group:SMD, 1.26; 95% confidence interval (CI), 0.85-1.66, P<0.001].
Conclusion: Our meta-analysis indicates that VPA monotherapy is associated with the increase in plasma homocysteine in patients with epilepsy and this association is influenced by race.

p077
The value of anti-epileptic medication (AEM) blood level determination
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The usefulness of anti-epileptic medication (AEM) levels has been questioned for a long time (St. Louis EK. Curr Neuropharmacol 2009;7:115-119.). This paper responds to these questions from the perspective of a single practice. Assessing levetiracetam (LEV) blood levels identified drug interactions with other AEMs (Stepanova D et al. Seizure 2014 (Article in Press).) and a range of 20-40 mg/L assisted in patient management, specifically modifying dosages to individual needs. AEM levels can enhance compliance and improve care. Monitoring levels, and noting significant changes, even without seizures, allows identification of failed compliance and introduction of remedies, such as a dosing diary. In a recent case this resulted in carbamazepine (CBZ) levels

rising from 19 µmol/L (Total) and 4.6 µmol/L (Free) to 27 µmol/L (Total) and 7.7 µmol/L (Free) without changing the prescribed regimen. Patel et al. 2012 demonstrated toxic lamotrigine (LTG) levels, without altered AEM regimen (Patel V et al. Epilepsy Res 2012;98(2-3):269-272.). The method of measuring LTG was unchanged and all patients remained on Lamictal®, the parent compound. The manufacturer (GlaxoSmithKline) confirmed that the source of LTG had changed, resulting in a generic marketed as the parent compound. Chan et al. 2008 demonstrated that free AEM levels isolated the likely responsible AEM in polypharmacy in a patient with toxicity symptoms (Chan K et al. Seizure 2008;17(6):572-575.). The patient was on valproate (VPA), phenytoin (PHT), CBZ and LEV with therapeutic total levels but VPA free levels were supra-therapeutic (93 µmol/L) and symptoms abated with modified VPA dosage. Blood level determination also has a role in better managing patient supervision in status epilepticus and cluster seizures (Patel V et al. Epilepsy Behav 2014;31:31-33.). It allows tailoring doses of medication to achieve more reliable outcomes. This paper highlights the benefits of AEM blood levels monitoring with reference to specific scenarios.

p078

Abuse of pregabalin and gabapentin by prisoners

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Purpose: Pregabalin and gabapentin are licensed to be used curing epilepsy, neuropathic pain as well as treating psychiatry patients in Turkey. The usage of them is not considered to be under any control mechanism.

Method: In this study, 30 patients whose ages are varying between 20 and 45 have been chosen as a target group among 1400 prisoners between 2012 and 2013. The common features of the group members are listed as follows: All the chosen prisoners are in a good condition in terms of health by now and at their early ages. Moreover, the target group are drug addicted (according to the DSM 5 criteria) before getting into the prison. The study is excluded the patients who refused to get examination as well as not willing to give any information.

Results: The results showed that all examined patients' neurological examination and electromyography are ordinary and they don't have any epilepsy history in their life. In the study the patients are classified according to taking pregabalin, gabapentin and both. 4 and 21 patients took 300-600mg pregabalin, 1600-3200mg gabapentin a day, respectively. However, 5 patients took both pregabalin and gabapentin at a different time schedule (randomly). The usage time of such medicine is varying between 1 and 5 years for all target patients. The consensus of the patients regarding the taking dose of medicine is the same.

Conclusion: To our best knowledge, the effect of pregabalin and gabapentin has not been completely understood. It is predicted that pregabalin, in neuron terminals, generates connection between voltage sensitive calcium channels and alfa-2-delta sub units inducing modulation in norotransmitters such as glutamate and norepinefrin. Due to lack of study regarding abuse of pregabalin ve gabapentin in the literature we intend to point out the importance of this issue.

p079

Oligohydrosis as adverse effect of Zonisamide

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Purpose: Zonisamide is classified as a sulfonamide and is characterized having multiple

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antiepileptic action-mechanisms including inhibiting carbonic anhydrase, which may lead to the oligohydrosis.The purpose of this study is including the followings: (1) to determine the incidence and (2) to reveal the risk factor of oligohydrosis-related symptoms in epileptic patients treated with zonisamide

Method: I prospectively studied 153 patients under 20 ages who was newly diagnosed with epilepsy or referred from other hospitals for controlling a seizure. The patients were treated with zonisamide as a monotherapy or adjuvant therapy. The data was collected by direct interview at least 3 months after taking zonisamide. Facial flushing, lethargy, itching sensation, irritability with hyperthermia, heat sensation and heat intolerance were considered as a oligohydrosis-related symptom.

Results: 24.8% of patients were treated by zonisamide as a monotherapy, and the other patients were treated by zonisamide as an adjuvant therapy. The oligohydrosis-related symptoms were observed in 11.1% of patients, and 2% of the patients have stopped taking zonisamide due to the symptoms. The oligohydrosis-related symptoms were observed more frequently in the patients between 15 and 20 years old than younger ages, and more frequently in the patients who had taken topiramate.

Conclusion: The frequency was significantly higher than the results from previous studies. Clinicians should monitor the patients who are taking zonisamide regarding the oligohydrosis-related symptoms. Especially, the patients between 15 and 20 years old ages and the patients who have a drug history of topiramate should be observed carefully.

p080

Topiramate use and the risk of glaucoma development in children; a pilot study from Lady Ridgeway Hospital for Children, Colombo, Sri Lanka

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Purpose: Acute Angle Closure Glaucoma (AACG) is a well recognized side effect of topiramate (TPM). This is an ocular emergency and receives distinction due to its acute presentation and call for immediate treatment.

The incidence or prevalence of AACG in the population of children treated with TPM is not known. Moreover the results of clinical studies or the case reports in adults cannot be indiscriminately extrapolated to children. Hence, this pilot study was conducted with the scope of demonstrating TPM use and the risk of glaucoma development in patients attending Lady Ridgeway Hospital for children, Colombo Sri Lanka.

Method: Current study was designed as an analytical, retrospective cohort study for apposite comparison of the exposed and the non-exposed groups.

Results: Exposed group (n=123), mean age 7.9-years, males-52.8%, non-exposed group (n=119). 47/123 (38%) on TPM had an electro clinical syndromic diagnosis while 54.4% had non syndromic epilepsies. 12/123 (9.7%) were on TPM monotherapy, whereas 46.3% were on two Anti-Epileptic-Drugs (AEDs) and 44% were on three or more. Mean treatment duration for TPM was 19.5-months (range=0.5-72-months), mean starting dose 1.6mg/kg/day (range=0.6-3mg/kg/day) and a maintenance dose of 3.6mg/kg/day (range=0.8-8.5mg/kg/day). There was no significant correlation between the treatment duration, starting dose or the maintenance dose of TPM and the mean Intra-Ocular-Pressure (IOP). On direct questioning 9/123 had symptoms (eye-pain=04, excessive tearing=03, visual disturbance=02), however had no raised IOP. None of the parents were aware of the warning symptoms of AACG. There was no significant difference

between the mean IOP of exposed versus the non-exposed.
Conclusion: TPM induced AACG is an uncommon side effect among children (0/123); clinical symptoms could be non-specific, suggest further (multicenter) studies including larger population size for confirmation.
Nonetheless, feasibility of measuring IOP in children for assessment of TPM induced AACG (with minimum resources available) is confirmed through this study.

p081
Drug-related problem in epilepsy clinic at Srinagarind Hospital,Thailand
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Purpose: To study the drug-related problems in an Epilepsy Clinic (EC) at Srinagarind Hospital, Thailand.
Method: This study was a retrospective study in which data was collected from a pharmaceutical care program in the EC and medical records. The patients who attended the EC during 2009 to 2012 and received pharmaceutical care were included in this study.
Results: A total of 211 patients were enrolled, 51.66 % were female and 48.34% were male. The mean age was 44.24±16.75 years. Patients visited in the EC for 2417 times or in average of 11.45 visits/person. We found 162 (76.78%) patients or 928 visits (4.39 visits/person) with drug-related problems. Most of problems were related to antiepileptic drugs (85.52%). Phenytoin and valproic acid were found with the problems in 297 (37.74%) and 286 (36.34%) visits, respectively. The most common drug-related problem was adverse drug reaction identified in 459 visits (49.46%). Among these, gingival hyperplasia (44.66%) and tremor (18.76 %) were mainly found. The second most common drug-related problem was non-compliance which was identified in 375 visits (40.41%) and under dosage was found the most (89.6%) in this group.
Conclusion: This study provides useful information on types of drug-related problem commonly observed in the EC, a team-based clinic. Monitoring of drug-related problems and patient counseling is very crucial for avoiding adverse drug reactions and maximizing the quality use of medicine.

p082
Drug-drug interactions affecting seizure control in an epilepsy clinic
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Purpose: Epilepsy patients sometimes are controlled with more than one antiepileptic drug (AED) and may require prescription drugs for treatment of concomitant diseases. Combinations of these drugs with AEDs may affect seizure control and increase risk of adverse drug reactions (ADRs). The aim of this study was to investigate association of prescription drugs-AEDs interactions with seizure control in outpatients who attended in an epilepsy clinic (EC) at Srinagarind Hospital, Thailand.
Methods: The retrospective-cohort study was carried out in patients who were aged 15 or over,

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had enrolled in the EC for a minimum of 3 months during 2011 and had been treated with at least one AED. The follow-up time was one year. Data were collected from chart reviews and an EC electronic database. Potential drug-drug interactions at the significance level of moderate to severe were confirmed by Micromedex® 2.0 Solution Web Applications Access and then used in analysis of the association with seizure control using Generalized Estimating Equation (GEE) in STATA SE program Version 11.1.
Results: A total of 382 patients attending 2369 visits were included. Combinations of AED with other prescription drugs were found in 20.5% (485 visits). Among these, the common interactions were simvastatin-phenytoin (27.9%), folic acid-phenytoin (15.7%), and aspirin-valproic acid (8.1%). Concomitant use of AED with other drugs was found to be associated with reduced seizure control (OR= 0.69 [CI = 0.48-0.99], p< 0.05). AEDs were used concurrently in 29.9% (708 visits). The three most common pairs were phenytoin-valproic acid (22.0%), lamotrigine-valproic acid (11.3%) and carbamazepine-valproic acid (8.2%). Using two or more AEDs concomitantly appeared to be significantly associated with reduction in seizure control (OR =2.46 [CI =1.82-3.32], p< 0.001).
Conclusions: Two types of interactions were significantly associated with reduction in seizure control. Closely monitoring is essential to assure efficacy of drug use and patient safety.

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Influence of patient adherence on seizure control: evidence from an epilepsy clinic in a tertiary care university hospital
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Purpose: Epilepsy requires antiepileptic drugs (AEDs) as a main treatment. Patient adherence plays a crucial role for success of treatment. This study was aimed to investigate the effect of patient adherence on seizure control.
Method: The study was carried out retrospectively in epileptic patients who attended in the EC during 2011. The patients who were aged 15 or over, had enrolled in the EC for a minimum of 3 months and been treated with at least one antiepileptic drug were included in the study. The follow-up time was one year. Data were collected from chart reviews and an EC electronic database. The association of seizure control with patient adherence was analyzed using Generalized Estimating Equation (GEE) in STATA SE program Version 11.1.
Results: A total of 382 patients attending 2369 visits were included in this study. A mean age of the patients was 40.4±0.8 years (15-83). Majority was female (51.1%). In average, duration of treatment with AEDs and time spent in the EC was 8.6±0.5 and 2.6±1.1 years, respectively. Patients had received 1.9±0.02 medications in average. Approximately 44.0% of patients were prescribed with monotherapy. Two and three concurrent AEDs were used in 32.0%, and 15.8% of patients. In average, non-adherence accounted for 1.5±0.2%. Among these, the most common type of patient non-adherence was medication underuse (93.2%). Majority of the patients (95.1%) had adherence at the level over 90%. Patient adherence at this level was found to be significantly associated with seizure control (OR= 0.59; 95% CI=0.43-0.81). In consistent, the similar association was confirmed by multivariate analysis (OR= 0.51; 95% CI=0.34-0.75).
Conclusion: This study provides comprehensive information on the link between great level of patient adherence and seizure control, reiterating the significance of adherence to medication treatment.

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Pilot study to estimate starting dosages of levetiracetam for elderly people

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Purpose: Levetiracetam (LEV) provides benefits of easy titration and short time to a steady state (< 48 h). Therefore, its starting dosage can be effective. Elderly people frequently suffer from renal dysfunction. Because LEV is mainly excreted from kidneys, start dosages for elderly people should be decided according to the glomerular filtration rate (GFR). A formula incorporating GFR as a variable must be found to estimate the starting dosage of LEV that provides a sufficient effect (i.e., serum concentration: 8-26 μg/mL). This study was conducted to produce a preliminary formula.
Method: Six elderly people with epilepsy (5 women, 77-99 y.o.) received duo-therapy with LEV and another anti-epileptic drug. The dose and serum concentrations of LEV were reviewed retrospectively to estimate the elimination rate constant (k_e) and clearance (CL_{LEV}). We assumed Vd (L) = body weight (BW)×0.5 and bioavailability rate = 1. From serum creatinine concentration, GFR was estimated according to formulae of the Japanese Society of Nephrology ($eGFR_{JSN}$) and the Chronic Kidney Disease Epidemiology Collaboration ($eGFR_{CKD\text{-}EPI}$). Correlation between CL_{LEV}, and $eGFR_{JSN}$ and $eGFR_{CKD\text{-}EPI}$ was tested using Spearman rs. Subsequently, linear regression was calculated. This study was approved by the local ethical committee.
Results: Mean k_e (1/hr) was 0.083 (SD = 0.03). Mean CL_{LEV} (mL/min) was 30.32 (SD = 10.79). Only $eGFR_{JSN}$ was correlated with CL_{LEV} (r_S = 0.829, p< .05). The linear regression formula was CL_{LEV}=0.644 ×$eGFR_{JSN}$ + 17.379. Therefore, a formula to estimate the dosage for trough concentrations (C_{min}) of LEV in a steady state was Dose = C_{min}×(BW×0.5) ×(1/exp(-(0.644 ×$eGFR_{JSN}$ -17.379)/(BW×0.5) ×τ)-1), where τ is the dosing interval.
Conclusion: Our formula can estimate an adequate start dosage of LEV with effective concentration. The formula is preliminary, with limited accuracy because of the few patients examined here. Further study is expected to yield an accurate formula.

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Effect of provocative factors on seizure control: evidence from an epilepsy clinic in a tertiary care university hospital

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Purpose: Seizures occur spontaneously in most of the cases but some may be associated with provocative factors. This study was performed to explore factors affecting seizure control in epileptic patients treated at a university hospital.
Method: The retrospective-cohort study was performed in epileptic outpatients who were attending the Epilepsy Clinic at Srinagarind Hospital, Thailand during 2011. The patients who were aged 15 or over, had enrolled in the Epilepsy Clinic for a minimum of 3 months and been treated with at least one antiepileptic drug were included into the study. The follow-up time was one year. Data of seizure control and triggers were collected from chart reviews and an electronic database. Data analysis was performed by using Generalized Estimating Equation (GEE) in STATA SE program Version 11.1.
Results: A total of 382 patients were included into the study and attended 2369 visits. The mean age was 40.4±0.8 years. Approximately 44% of the patients had at least one provocative factor and the three most common factors were sleep deprivation (21.5%), stress (17.5%) and

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menstruation (7.1%). By multivariate analysis, menstruation (OR=16.46, 95% CI 5.41-50.09), sleep deprivation (OR=6.82, 95% CI 4.74-9.80), exhaustion from work (OR=5.59, 95% CI 2.21-14.14), alcohol drinking (OR=4.65, 95% CI 2.34-9.25), stress (OR=4.37, 95% CI 2.96-6.43), extreme temperature (OR=3.93, 95% CI 1.82-8.47) were the independent predictive factors of seizure ($p < 0.001$). Caffeine drinking was the independent factor of seizure at p value < 0.05 (OR=6.07, 95% CI 1.80-20.45).
Conclusion: The seizure control was influenced by various provocative factors. Avoidance of these factors should be emphasized to the epilepsy patients for improving clinical outcome and quality of life.

p086
Efficacy and tolerability of sodium valproate in our paediatric population: a case series in the local population
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Purpose: Sodium valproate is one of the most useful drugs commonly used to treat epilepsy in the paediatric population. Its usage includes a broad spectrum of all types of seizures and syndromes. However, there are instances of treatment failure and significant adverse effects. We aim to describe the circumstances when sodium valproate failed to control seizures, as well as the side effects experienced.
Method: We analyzed the data of patients who are on second-line antiepileptic medications due to suboptimal response to sodium valproate. We also included patients who have experienced side effects ranging from weight gain to acute pancreatitis, which is a rare but severe adverse reaction.
Results: Among the thirty-two patients analysed, the types of epilepsy included benign myoclonic epilepsy, benign occipital epilepsy, idiopathic generalized epilepsy, West syndrome, epilepsy resulting from traumatic brain injury and neurocutaneous syndromes such as tuberous sclerosis and Sturge-Weber syndrome. Twenty-four patients (75%) had breakthrough seizures while on monotherapy of sodium valproate and six patients (18.8%) experienced weight gain. The mean weight gain increase was 1 kilogram per month per patient. One patient (3.1%) experienced alopecia, one patient (3.1%) had thrombocytopenia and one patient (3.1%) had elevated liver enzymes. Significantly, two patients (6.3%) had acute pancreatitis. Sodium valproate was stopped for both patients with acute pancreatitis. However, the episode recurred for one patient. Further imaging revealed a congenital anomaly of the pancreas - pancreas divisum.
Conclusion: In our study population, the most common reason for adding or converting anti-epileptic therapy while on sodium valproate was breakthrough seizures. However, mild to severe adverse reactions have been observed. Thus, when selecting a patient´s anti-epileptic medication, one should consider factors predisposing to potential side effects or complications. The importance of appropriate patient counseling before and during the treatment process should also be emphasized.

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Efficacy and safety of adjunctive perampanel for the treatment of refractory partial seizures in Asian patients: a subanalysis of pooled Phase III study data

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Purpose: An Asian subanalysis of three phase III studies (304, 305, 306) to evaluate perampanel, an α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor antagonist, as adjunctive therapy for refractory partial seizures.

Method: Patients aged ≥12 years, with partial seizures despite receiving 1-3 antiepileptic drugs, were randomized to once-daily placebo, perampanel 8 or 12 mg (studies 304, 305), or placebo, perampanel 2, 4, or 8 mg (study 306). Studies included a 6-week baseline period and double-blind treatment phase (6-week titration; 13-week maintenance). Primary endpoints were median change in partial seizure frequency (baseline vs double-blind phase) and 50% responder rate as percentage of patients achieving ≥50% reduction in seizure frequency (baseline vs maintenance). Safety assessments included reports of treatment-emergent adverse events (TEAEs), serious TEAEs, and discontinuations due to AEs. Statistical significance was evaluated for perampanel 8 mg vs placebo as numbers of patients receiving perampanel 4 or 12 mg were low.

Results: The subanalysis set included 276 patients. Median changes in partial seizure frequency were greater with perampanel 8 mg than placebo (perampanel 8 mg, -38.89%; placebo, -11.57%; $p< 0.0192$), as were 50% responder rates (perampanel 8 mg, 44.6%; placebo, 21.6%; $p< 0.0038$). Perampanel was generally well tolerated. The most frequent TEAEs were dizziness, somnolence, headache and fatigue. Most TEAEs were mild/moderate. Rates of AEs leading to discontinuation were 7.7% with perampanel 8 mg and 1.3% with placebo; relatively few patients experienced severe TEAEs (perampanel, 8.9%; placebo, 5.4%) or serious TEAEs (perampanel, 5.5%; placebo, 5.0%). There were no deaths and no clinically important mean changes in laboratory values, electrocardiography findings, or vital signs.

Conclusions: Perampanel reduced partial seizure frequency and improved responder rates compared with placebo, with an acceptable tolerability profile. The Asian subanalysis is comparable to the pooled phase III analysis.

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Methylpednisolone pulse therapy of MAE

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Purpose: Myoclonic astatic epilepsy (MAE)is a difficult to treat idiopathic generalized epilepsy of early childhood. MAE of unfavourable prognosis is often included by nonconvulsive status epilepticus. The objective of the study was to explore clinical, electroencephalography (EEG) of intravenous Methylpednisolone (MP) pulse therapy of twelve patients of MAE.

Method: In an retrospective study, twelve MAE patients admitted to the our department between Janurary 2004 and December 2013 who by video- Electroencephalograph (VEEG), received MP intravenous Pulse therapy followed By prednisone administration, Additionally, an effects was analyzed for each patient. The study was to object clinical ,Electroencephalograph on MP

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intravenous Pulse therapy.
Results: Four out of twelve patients had a complete remission of seizures and the EEG showed reduced epileptiform discharges both oft hem. The result had a significant seizure reduction in four patients and the EEG showed reduced epileptiform discharges both of them. Seizure frequency had a mild decrease in two patient and increased in one patient. No severe adverse effects were found.
Conclusion: MP pulse therapy can alleviate the symptoms in child with MAE, if anti-epileptic drug treatment is not effective, it could be a eligible therapeutic option.

p089
Levetiracetam-induced skin rash and its association with the HLA genes in Chinese patients with epilepsy
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Purpose: The aims of this study were to report several rare patients with epilepsy who developed skin rash induced by levetiracetam (LEV) and to explore its possible genetic association with the human leukocyte antigen (HLA) genes.
Method: Four cases with LEV-induced mild skin rash were recruited from our hospital. Demographic and clinical information of these cases was summarized. Additionally, cases were matched (1:5) with LEV-tolerant controls. High-resolution HLA genotyping was performed for each participant. Differences in the allele frequencies between cases and controls were compared.
Results: The onset of skin rash for these cases occurred within 30 days of LEV exposure. The mean latency to skin rash from LEV exposure was 13.25 days (ranging 1-30). The carrier rates of the two alleles, HLA-DRB1*0405 and HLA-DQB1*0401, were significantly higher in cases compared with controls (50% vs. 0; p=0.022; OR 21.000; 95%CI 1.613-273.340).
Conclusion: Safety monitoring was necessary within the first month after starting LEV treatment. The HLA-DRB1*0405 and HLA-DQB1*0401 alleles may be two risk predictors for LEV-induced mild skin rash in Han Chinese. The present findings provide first evidence of genetic markers for LEV-induced cutaneous hypersensitivity reactions.

p090
Effects of long term antiepileptic drugs on serum vitamin D level in a cohort of Sri Lankan children with epilepsy
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Purpose: To demonstrate an association between Vitamin D levels and anti epileptic drugs (AED) usage.
Method: A retrospective cohort study was performed on 205 children aged 1-12 years presented to a tertiary care hospital in Sri Lanka; 119 with epilepsy, exposed to AEDs more than 2 years and 86 who are not exposed to AEDs. Vitamin D levels were analyzed by chemiluminescent auto analyzer method. The prevalence of Vitamin D deficiency among children exposed and unexposed to AED was compared. Among exposed the effect of AED combinations on Vitamin D deficiency was assessed.
Results: A higher proportion of children on AED were deficient in Vitamin D (53.7%) compared to children who are not on AED (45.3%) though the difference was not significant (p=0.233).

Difference of Vitamin D deficiency among those on poly AED therapy (59.5%) and single AED (50.6%) were non-significant (p=0.353). Similarly, differences of Vitamin D deficiency in those on Carbamezapine mono therapy (50%; n=18/36) and Sodium Valproate mono therapy (60.7%; n=17/27) were non-significant (p=0.4).
Conclusion: Vitamin D deficiency was not associated with long term AED use in children with epilepsy. Being on polytherapy or being on Carbamezapine over Sodium Valproate was not associated with Vitamin D deficiency.

p091
Epilepsy control with phenobarbital: observational study among Filipino children
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Purpose: Phenobarbital has been in use for more than a century to control seizures. It is the oldest, cheapest and the most prescribed antiepileptic drug worldwide especially among developing countries like the Philippines. The ease of administration, accessibility and the cost-effectiveness of this drug have been the determinants of its widespread use. The WHO recommends its use as first-line for partial and generalized seizures in the developing countries. However, recent studies identified its negative effect on cognition and behavior among children. Adverse effects of the drugs should also be a determinant in choosing the best treatment for the control of seizure. Current data shows phenobarbital depresses cognitive performance which may outlast its administration and is not compensated by the benefit of seizure prevention.
This paper aims to describe the current status of phenobarbital use among children with epilepsy in the Philippines. Specifically, this aims to identify the seizure type, syndrome, and / or etiology of patients prescribed with phenobarbital, to determine the frequency of its use, to describe the seizure control and to describe its side effects.
Method: A prospective, observational study was performed in a tertiary government hospital in Manila, Philippines.
Results and conclusion: Majority of the patients seen are male (58.9%), between 6-12 years old (32%). Seventy-five percent have partial seizures of structural/metabolic etiology (62%). Among all types of seizures, there was fair seizure control (37-57%). Phenobarbital is the most common antiepileptic drug prescribed (78%) and given as a monotherapy (30%). A third of the patients prescribed with Phenobarbital were given an additional drug, carbamazepine (30%). About 21-26% of the patients initially given Phenobarbital were shifted to carbamazepine and valproic acid. Most common reasons for adding or shifting to another drug were poor seizure control (53%), adverse reactions (42%), behavioral changes (48%) and cognitive decline (29%).

p092
Levetiracetam or valproic acid monotherapy of low dosage for children with typical benign childhood epilepsy with centrotemporal spikes (BECTS)
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We compared the therapeutic efficacy of levetiracetam versus valproic acid in a cohort of newly-diagnosed children with typical benign childhood epilepsy with centrotemporal spikes (BECTS). 33 patients who received levetiracetam and 23 patients who received valproic acid were included in the analysis. The average dosage of LEV we prescribed is 25.8±6.4 mg/kg/day and the average dosage of VPA is 21.7±7.4 mg/kg/day. Seizure-freedom rates were not significantly different in the two groups at 6 (57.5% vs 60.9%), 12 (81.8% vs 73.9%) and 18 months (all seizure free). However,

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more children taking VPA achieved EEG normalization than did those taking LEV both at 12 (78.3% vs 45.5%) and 18 months (95.7% vs 72.7%) (p< 0.05). No children discontinue therapy due to adverse effects during the follow-up. Only one child (4.7%) in VPA group showed mild weight gain which did not interfere with compliance. In this study, no significant differences were seen in controlling seizures in both groups, but valproic acid demonstrated better efficacy than leveraticetam in improving abnormalities on the EEG in BECTS. Few patients discontinued therapies probably due to low dosage we prescribed in both groups. Our data demonstrated that the low dosage of VPA or LEV monotherapy is effective in controlling seizures and promote compliance in children with BECTS.

Basic science

p094
Molecular mechanisms of tumor-related epilepsy
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Seizure is a frequent symptom in patients with brain tumor and the impact of epilepsy on the total disease burden is high. The specific events that occur in the lesion and lead to seizure are poorly understood. Multiple possible mechanisms are involved, including tumor-related factors, environment-related factors and functional changes.This paper aimed to review the pathogenesis of tumor- related factors and cellular mechanisms that contribute in epileptogenesis.
Disturbed communication between cells contributes to epileptogenesis as overexpression of connexin 43 in low-grade gliomas and the peritumoral cortex and overexpression of connexin 32 in oligodendroglioma and glioneuronal tumors. Dysregulation of voltage-gated ion channels and transporters also can contribute to epileptogenicity in glioneuronal tumors. Glial tumor cells express abnormal compounds like synaptic vesicle protein 2A which its dysfunction leads to calcium accumulation during repeated action potential generation and might play an important role in epileptogenesis. Expression of specific glutamate receptor subtypes, decreased expression of glial glutamate transporters, absence of Na+ dependent glutamate uptake and usage of cystine glutamate system resulting high glutamate release and low uptake and also downregulation of GABAa receptor subunits, are some other possible causes for epileptogenicity of gliomas and gangliogliomas. The role of genetic is also prominent as low expression of potassium channel genes and activation of several components of the phosphatidylinositol-3 kinase mammalian target of rapamycin signaling pathways in ganglioglioma and low expression of leucine-rich glioma inactivated gene 1, in glioma might contribute to epileptogenesis and suggest a common genetic pathways for tumor-associated epilepsy and genetic status. Further studies assessing involved pathological factors and mechanisms will provide greater chance for more effective antiepileptic treatment in patients with brain tumor.

p095
Aquaporin 4 is increased in the splenium of corpus callosum after pilocarpine-induced status epilepticus
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Purpose: Metabolic changes in status epilepticus (SE) may cause regional cytotoxic or vasogenic edema such as in the splenium. However, the mechanism responsible for the lesion in the

splenium is poorly understood. AQP4 has been proposed to play an important functional role in water balance of the brain parenchyma by enhancing transmembrane water flux. Thus, the present study was conducted to provide evidence as to whether AQP 4 has different expression on the splenium during and after pilocarpine-induced status epileptic rats.
Method: Sprague-Dawley (SD) rats (9-11 weeks old) were given LiCl (127 mg/kg, intraperitoneally 20 hours before the pilocarpine treatment. Animals were treated with pilocarpine (25 mg/kg, i.p.) 30 minutes after scopolamine butylbromide (2 mg/kg, i.p.). Diazepam pretreatment completely prevented SE. Diazepam-pretreated animals were used as controls at designated time courses (1 day, 2 days, 1 week, and 4 weeks after SE, n = 5). The tissues were incubated in rabbit anti-AQP4 antibody and then incubated sequentially in goat anti-rabbit-pig IgG. All data obtained from image analysis were analyzed using one-way ANOVA test to determine statistical significance. Bonferroni's test was used for post hoc comparisons.
Results: In non-SE animals, AQP4 immunoreactivity in the splenium was significantly higher than that in other regions ($p < 0.05$). Following SE, AQP4 immunoreactivity was significantly elevated in the corpus callosum compared to non-SE animals ($p < 0.05$). The increase in AQP4 immunoreactivity was peaked at 2 days after SE.
Conclusion: These results suggest that cytotoxic edema on the splenium is related with AQP 4 change. AQP4 is expressed in astrocyte foot processes surrounding capillaries, astrocyte processes comprising the glial limiting membrane, in ependymal cells, and in subependymal astrocytes. Therefore, increased AQP4 in the splenial astrocyte may be an important role to early develop cytotoxic edema after SE.

p096

Age-specific effect of postnatal exposure to morphine on pilocarpine-induced seizure in mice

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Purpose: Exposure to morphine during gestation has been reported to have excitatory or inhibitory effects on epilepsy in mice. The present study aimed to investigate effect of postnatal exposure to morphine on pilocarpine- induced seizure in mice.
Method: Male neonate mice were divided to 8 groups (n=6, each). On postnatal day 8-14 (P8-P14), morphine was injected subcutaneously to half of the mice while the other half received saline similarly. Morphine and saline groups were further divided to 2 equal groups, one of them studied on P22 and another on P32. In saline group, half of the mice received pilocarpine while the other half, received saline 30 min before receiving pilocarpine. In morphine group, half of the mice received pilocarpine and another half, received morphine 30 min before receiving pilocarpine. The mice were injected with pilocarpine and the behavior of each mouse was observed in all groups. Trunk blood was collected and corticosterone was measured 24 hou r after seizure.
Results: Exposure to morphine potentiated pilocarpine-induced seizure. Latency of first seizure activity was decreased in morphine 22-day old group compared to saline 22- day old mice. Opposite outcomes were observed in 32-day old mice. Corticosterone blood level significantly increased in morphine 22-day old group in comparison to saline 22-day old mice, whereas, there was no significant difference in 32-day old mice.
Conclusion: Chronic exposure to morphine during infancy has significant influence on Pilocarpine-induced seizures in mice. This effect might be implemented by changes in Corticosterone blood levels. The age-specific alteration in brain susceptibility to pilocarpine-induced seizures may be related to normal brain maturation in mice.

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Interleukin-1β increases epileptogenesis after prolonged febrile seizures through cannabinoid type 1 receptor signaling

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Purpose: To investigate how infantile febrile seizures (FS) precipitate adult seizure susceptibility and the role of Interleukin-1β in the epileptogenesis after infantile FS.

Method: We used a well-established animal model in which FS are evoked by exposing rat pups to a hyperthermia environment. IL1Ra, CB1R blockade or knockdown, or inhibition of endocannabinoid synthesis were used. The level of IL-1β and CB1R were tested by western blot. Seizure susceptibility was tested when when the rats grew up.

Results: interleukin-1β (IL-1β) concentrations was rapidly elevated for 12 hours after prolonged but not simple FS and enhanced seizure susceptibility in adulthood, both of which were blocked by interleukin-1 receptor antagonist (IL1Ra) within a critical time window. While IL-1β alone enhanced seizure susceptibility, mice lacking IL1R1 were resistant to seizures after prolonged FS or IL-1β treatment. Expression of the cannabinoid type 1 receptor (CB1R) in GABAergic neurons, increased at 3 days after prolonged FS or IL-1β treatment for at least 50 days, and this was blocked by IL1Ra. CB1R blockade or knockdown, or inhibition of endocannabinoid synthesis, abolished FS-enhanced seizure susceptibility. In addition, expression of CB1R was upregulated only in the patients with TLE who had a history of FS.

Conclusion: A transient increase of IL-1β after infantile prolonged FS participates in adult epileptogenesis via regulating endocannabinoid signaling. These findings indicate that IL-1β is an important factor in promoting seizure susceptibility after prolonged FS and IL-1β can be targeted to prevent temporal lobe epilepsy after prolonged FS.

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Postnatal interleukin-1β after experimental prolonged febrile seizures enhances epileptogenesis in adulthood

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Purpose: It remains unclear whether childhood prolonged febrile seizures facilitate temporal lobe epilepsy with hippocampal sclerosis in adulthood. Interleukin (IL)-1β was reported to associate with acute and long-lasting effects on neuronal excitability in children and immature animal models. Here, we used a prolonged hyperthermia-induced seizure (pHS) model as a rat model of prolonged febrile seizures to study the effects of IL-1β on adult epileptogenesis, hippocampal damage, and cognition.

Methods: We induced pHS on postnatal days (P)10-11 and intranasally administered IL-1β or saline immediately after the seizure. Motor and cognitive functions were assessed at P85 using the rotarod and passive avoidance tests. EEG recordings were conducted at around P90 and P120. Hippocampal CA1 and CA3 neurons were counted at the end of the experiment.

Results: Spontaneous seizure incidence was significantly greater in the pHS group with IL-1β than that in the pHS group without IL-1β and in the control group. Seizure frequency and number of

interictal events did not differ significantly between the three groups and no motor deficits were observed. Passive avoidance learning was significantly impaired in the pHS group with IL-1β when compared with controls, but not when compared to the pHS group without IL-1β. Hippocampal cell numbers did not differ between the three groups. These results suggested that neuronal loss is not a prerequisite for the epileptogenic process that follows pHS.
Conclusion: IL-1β is thought to have a function as a N-methyl-D-aspartate (NMDA) receptor agonist, and NMDA receptor function is thought to play an important role in the pathogenesis of both ictogenesis and epileptogenesis in humans. Our results showed that infantile prolonged febrile seizures combined with IL-1β overproduction could enhance adulthood epileptogenesis, and might contribute to the development of temporal lobe epilepsy with hippocampal sclerosis.

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High mobility group box 1 enhances hyperthermia-induced seizures in developing rats
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Purpose: Levels of high mobility group box (HMGB) 1, an important inflammatory mediator, have been shown to be higher in the serum of febrile seizure (FS) patients when compared with fever-only controls. However, the role of HMGB1 on FS remains controversial. Here, we investigated the role of HMGB1 on hyperthermia-induced seizures (HS) in immature rats as a model of human FS.
Methods: Thirty male Lewis rats were implanted with electroencephalogram electrodes (11-12 days old) and divided into three groups: high-dose HMGB1 (h-HMGB1: 100 μg of recombinant human HMGB1), low-dose HMGB1 (l-HMGB1: 10 μg of HMGB1), and a control group. We applied HMGB1 intra-nasally 1 h before warm air-induced seizures. The core temperature at the appearance of seizure discharge and the seizure duration were measured. In addition, hippocampal cell injury, astrogliosis, and the number of microglia were monitored at 2 weeks after HS (28-29 days old).
Results: The core temperature at seizure onset in the h-HMGB1 group (40.8 ± 1.0°C) was significantly lower than that in the control group (41.6 ± 0.9°C) (P=0.044), and seizure duration in the h-HMGB1 group (10 ± 2 sec) was significantly longer than that in the control group (6 ± 2 sec) (P=0.044). However, no significant differences in neuronal cell loss, astrogliosis, or number of microglia were identified among the h-HMGB1 and control groups.
Conclusions: HMGB1 enhanced HS in immature rats, but did not induce any hippocampal cell damage. Further studies using a prolonged FS model are required to clarify the role of HMGB1 in late onset epileptogenesis in the developing brain.

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Preventive effect of Levetiracetam against the pathological changes in hippocampus of temporal lobe epilepsy model mice
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Purpose: It is advocated the first epileptic seizure causes continuously pathological and electrophysiological change in hippocampus, leading to the development of epileptogenesis. The preventive treatment with anti-epileptic drugs has a prospect against the development of epileptogenesis. We evaluated the effect of continuous treatment with levetiracetam (LEV) on pathological changes in epileptic mice hippocampi.

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Method: Eight week-old male C57BL6 mice were used in our study. We classified them into three groups: Group A was treated with saline injection for 5 days after the development of status epilepticus (SE), Group B was treated with LEV (200mg/kg/day i.p.) for 5 days after SE, and Group C was injected saline for 5days without SE. SE was induced by pilocarpine injection (280mg/kg i.p.), and all animals were treated with diazepam (10mg/kg i.p.) to sedate SE. We injected Green Fluorescence Protein (GFP)-labeled retrovirus into bilateral hippocampal dentate gyrus (DG) stereotactically two days after pilocarpine injection to visualize mitotic newborn neurons. All mice were euthanized 14 days after development of SE and then removed a brain.
We compared the number of GFP-labeled newborn cells in DG among three groups and performed statistic analysis with ANOVA (p-value: < 0.05). We also compared the morphological features of newborn cells among three animal groups.
Results: The number of GFP-positive newborn neurons in DG was significantly lower in group B comparing to group A (P< 0.01). Other GFP-positive newborn cells co-stained with NG2 was also detected and the number of them in group B was significantly lower than group A. The form of axons in group A was extremely irregular. There was no difference between group B and C, suggesting that continuous treatment with LEV inhibited epilepsy-induced neurogenesis.
Conclusion: Continuous treatment with LEV suppressed epilepsy-induced neurogenesis in mice hippocampus. Preventive treatment with LEV has potentials to inhibit pathological changes in hippocampus.

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Expression and distribution of HMGB1 in Sombati's cell model and kainic acid-induced epilepsy model

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Purpose: To observe the changes of HMGB1 in Sombati's cell model and kainic acid-induced epilepsy model.
Method: In vitro, dissociated hippocampal neurons from neonatal SD rats and cultured for 9 days, then dealed with Mg2+ -free medium for 3 hours to induce Sombati's cell model. The expressions of HMGB1 in the neurons were determined at 24h and 72h by western blotting. In vivo, appropriate kainic acid was injected into the lateral ventricles to induced epilepsy rat model, and then the expression and distribution of HMGB1 at time points of 24h and 72h were established by immunohistochemistry.
Results: Both in vitro and in vivo, the expression of HMGB1 appeared to difference between model group and control group, at the time point of 24h, the expression of HMGB1 in the model group was lower than the control group (P< 0.05), but the expression of HMGB1 in the model group was higher than the control group at the time point of 72h (P< 0.05). In addition, the relocation of HMGB1, which showed nucleus-to-cytoplasm translocation was discovered in the model group in kainic acid-induced epilepsy rat model.
Conclusion: Increased expression was detected in low-Mg2+ induced Sombati's cell model and kainic acid-induced epilepsy rat model, and the relocation of HMGB1 was discovered in epilepsy rat model. HMGB1 plays a crucial role in the pathophysiology of epilepsy.

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Essential oil *from* Aconitum *cochleare* modulates the gene expression of *BDNF*, *TrkB* and oxidative stress parameters in a mouse model of epileptogenesis with safe toxicity profile

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Purpose: Neurotrophic factors and Oxidative stress are emerging as mechanisms that may play an important role in the etiology of seizure-induced neuronal death. In the present study, *Aconitum cochleare* WOROSCHIN-oil (ACR-oil) was tested for its ability (i) to suppress the convulsive and lethal effects of Pentylenetetrazole (PTZ) in kindled mice, (ii) to attenuate the PTZ-induced oxidative injury in the brain tissue and (iii) to modulate the gene expression *BDNF* and its receptor *Trk-B* when given as a pretreatment prior to each PTZ injection during kindling acquisition. Diazepam and valproic acid, major antiepileptic drugs, were also tested for comparison.

Methods: Once acute screening was done, all groups except for control group were kindled by injections of PTZ with an interval of 48 h (n=12). In the 18th injection, all groups were sacrificed and the brain samples were collected and used for determination of oxidative stress parameters and targeted gene expressions by PCR.

Results: Our results suggest that ACR-oil treatment (100 mg/kg, 200 mg/kg) significantly inhibit, both acute and chronic PTZ induced seizures ($p< 0.05$). Toxicity studies demonstrate that the test oil is devoid of major toxic effects on suggested doses. Our test oil not only produced antiepileptic effect but also diminished the PTZ induced oxidative stress ($p< 0.05$, $p< 0.001$).

Conclusions: Based on our results, we conclude that ACR-oil might be acting as an antiepileptogenic lead formulation by controlling the cellular expression of the factors that contribute in the development of epileptogenic plasticity in the CNS. However, further studies are required to elucidate its mechanism of action.

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Memory impairment caused by spreading depression modulated by injection of Nifedipine

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Purpose: Spreading depression is known by transient loss of spontaneous and evoked neuronal activity and changes in ionic, metabolic and hemodynamic characteristics of the brain. Many studies have focused on the role of Ca^{2+}channels in spreading depression, however this role is not completely clear yet. On the other hand it has proven that impairment of memory is one of the main effects of repetitive spreading depression. In our study we aimed at determining the role of Ca^{2+}channel-blocker, Nifedipine, on repetitive spreading depression in terms of its effect on memory

Method: Wistar rats (60-80gr) were divided into 4 groups and Nifedipine (1 mg/kg) were administrated weekly in the rats of treatment group for 4 weeks. Induction of repetitive spreading depression performed by 4 times injection of KCl (2 M) separated by 1 week.

Results: Retrieval of spatial memory was evaluated by T-maze memory test and spreading depression group was compared with other groups. T-maze test data demonstrated that in repetitive spreading depression group memory was impaired during the weeks. In the treatment group, in which Nifedipine has been administrated memory retrieval significantly improved.

Conclusions: Our study showed that administration of Nifedipine as a Ca^{2+} channel-blockers could significantly reduce the level of memory impairment, which naturally followed by repetitive spreading depression.

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Spreading depression enhances neurogenesis in hippocampus and dentate gyrus

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Purpose: Spreading depression (SD) known by transient loss of spontaneous and evoked neuronal activity and changes in ionic, metabolic and hemodynamic characteristics of the brain. SD plays an essential role in some neurological disorders including migraine with aura, epilepsy, and cerebrovascular disease. Neuronal damage followed by SD, supposed to have a dramatic impression on SD-derived pathologic conditions. We aimed to determine whether SD is able to stimulate persistent neurogenesis in WAG/Rij rat as a model for absence epilepsy.
Method: WAG/Rij rat (60-80gr) randomly chosen and 3 mol/L KCl injected for induction of SD. Four weeks after the first injection, all rats were decapitated and the brains removed. The density of mitotic cells, divided cells, and new neurons in the pyramidal cell layer of hippocampal CA1 and CA3 and granular cell layer of dentate gyrus was assessed. We also detect the DNA during the S phase using Bromodeoxyuridine (BrdU).
Results: A remarkable increase occurred in the number of BrdU-labeled cells in hippocampal region, detected by immunohistochemistry method. Th e density of mitotic cells, divided cells, and new neurons in hippocampal CA1 and CA3 and granular cell layer of dentate gyrus also increased.
Conclusion: We conclude that Spreading depression potentiates to trigger persistent neurogenesis in hippocampus of rat model of absence epilepsy.

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The antiepileptic and neuroprotection role of Scl element in experimental study

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Purpose: To study the antiepileptic and neuroprotection role of fructus schisandrae SCL on rat epilepsy models.
Method: 20 kunming species of rats, 10 in each group, intraperitoneal inject scopolamine nitric acid methyl ester (1 mg/kg), 20 minutes to give ordinary card product (320-350 mg/kg, intramuscular) induced rats first onset of status epilepticus, after the success of the induction to diazepam 5 mg/kg intramuscular injection, the seizure terminate. Then record the numbers of seizures in rats and the whole process of epilepsy 1 month with video, seizure happens above 3 times within a month as a successful models. The experimental group give SCL 80 mg/kg after feeding, the control group rats eats normal . observe the rats epileptic seizures of two groups with Video records. Stop recording after the completion of each group 10 rats, executed perfusion in brain, brain volume ratio by weight 1:9 add 4 °C physiological saline, the preparation of 10% homogenate. Application of spectrophotometric method and coomassie brilliant blue legal protein. Inspection records in the two groups of mice serum and brain tissue NO, T - AOC, SOD and MDA content. Analysis of schisandra lignin nerve protective effect on epilepsy model rats.
Results: The results of Video recording showed: in the experimental group (40 rats) has 5 seizures (attack rate of 8%), the control group has 33 seizures (82.5%). which show that the SCL has the effect to reduce the number of epileptic seizures significantly. The blood and brain tissue SOD activity and T AOC in experimental rat significantly reduce, the content of MDA, NO decrease obviously.

Conclusion:
1. The SCL grain have the ability to reduce the number of epileptic seizures.
2. The neuroprotection and antiepilepsy role of SCL are through reducing the the formation of free radicals and antioxidant effect on epilepsy rats.

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Effects of α-asarone on transient outward potassium current in vitro primary culture of hippocampal neurons of rat

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Purpose: To observe changes in transient outward potassium current (I_A) after intervention with various concentrations of α-asarone and explore the effects of α-asarone on I_A preliminarily in vitro primary culture of hippocampal neurons of rat.
Method: Dissociated hippocampal neurons from neonatal SD rats were cultured in vitro for 8 days, the whole-cell patch-clamp technique was used to record I_A of hippocampal neurons in normal control group, and the respective drug treatment groups after 24h intervention with 15 μg/ml, 30 μg/ml and 60 μg/ml α-asarone.
Results: Compared with normal control group, the I_A peak increased significantly in drug treatment groups, the IA peak in the 3 concentrations of drug treatment groups increased with higher α-asarone concentrations. the difference in I_A peak among the 3 concentrations of drug treatment groups had statistical significance.
Conclusion: Alpha-asarone intervention further increases I_A in vitro primary culture of hippocampal neurons and presumably the protection of a-asarone on hippocampal neuron under physiological status may be related to the cellular protection on improving cerebral blood flow and learning memory by opening A-type potassium channel so as to increase I_A.

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The expressions of ERK1/2, Caspase-3 in the human brain with refractory epilepsy

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Purpose: To ensure the expressions of ERK1/2,Caspase-3 in the human brain tissue with refractory epilepsy and research the relationship between ERK signaling pathway and neuronal apoptosis, glial cell proliferation in these patients' brain tissue.
Method: Collecting the information of the experimental group of 24 patients with diagnosis of refractory epilepsy and simultaneous surgical treatment, as well as control group cases of temporal or frontal lobe brain tissue which are from autopsies of unnatural death. The expressions of ERK1/2, Caspase-3 in the two brain tissues through immunohistochemical method were observed, and the results were analyzed with statistical method.
Results: The positive cell numbers of ERK1/2 and Caspase-3 of the experimental group were 13.08±5.90,28.04±6.87, while the numbers of positive cells were 6.00±0.00,16.00±1.41 in the control group. There was statistically significant difference between the experimental and control group. The expression level of ERK1/2, Caspase-3 in the brain tissue of patients was associated with seizure frequency. The numbers of positive cells were 13.31±5.88, 28.38±6.15 in the group which is less than 10 attacks per month, while the numbers of positive cells were 12.82±6.19,27.64±7.92 in the group which is more than 10 times per month. There was no obvious difference between the two groups ($P>0.05$).
Conclusion: ERK1/2 was widely expressed in neurons and with refractory epilepsy, Caspase-3 was

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widely expressed both in neurons and neurogliocytes, which was significantly more than control group(P<0.05). However, the expression of ERK and Caspase-3 was not related to the frequency. The signal pathway of ERK and Caspase-3 may be involved in the pathophysiological process of nerve cell apoptosis and gliocyte proliferation after the seizure.

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The dosage of pilocarpine to induce status epilepticus in animal model of epilepsy

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Purpose: Mechanism of epileptogenicity is remained not well understood until now, although epilepsy has been recognized for several centuries. Research in human being have several limitations, especially in ethics. Therefore animal model was widely used for epilepsy research mainly in field of epileptogenicity mechanism.
Pilocarpine is one of several agents can induce status epilepticus in rodent. However, we can not find reference of suitable dose for mice in Indonesia. The purpose of this study is to determine the suitable dosage of pilocarpine to induce status epilepticus in mice.
Method: This was a preliminary study of doctoral research. We used 32 BALB/c mice for animal model. All of them were male, body weight were 25g - 30g, divided into four groups. A dosage of 200mg/kg pilocarpine was injected intra peritoneal (ip) into mice group one, 210mg/kg was given into group two, 220mg/kg was given into group three, and 250mg/kg was given into group four. Behavioral seizures were recorded by video camera for six weeks. Decapitation was performed to all mice that survive for six weeks. Mouse brain was proceeded for histopathologic examination.
Results: There was no evidence of status epilepticus in group one. All of mice in group four got status epilepticus, but all of them died. Six mice in group two got status epilepticus, four of them survived until six weeks. Seven mice in group three got status epilepticus, three of them died during the first day after status epilepticus. Using Kruskal-Wallis test analysis, there was significant difference among groups (p< 0.05) and the best dosage (mice got status epilepticus and survived) was 220mg. Histopathological study revealed damage in hippocampus from all mice brain with status epilepticus and survived. The damage was seen especially in the CA3.
Conclusion: Suitable dosage of pilocarpine to induce status epilepticus in mice is 220mg.

Clinical neurophysiology

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Evaluation of the burst-suppression pattern after hemispherotomy

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Purpose: The burst-suppression (BS) pattern is identified in various conditions which include deep anesthesia, cerebral hypoxia, deep coma, encephalopathies or status epilepticus. Although the neurophysiological mechanisms remain unresolved and obscure, BS is thought to be associated with cortical and thalamic connections. To clarify the relationship between BS and cortical and thalamic connections, we reviewed the changes on the electroencephalography (EEG) of BS after hemispherotomy, which disconnected cortical and thalamic signals.

Method: We reviewed the chart records of patients with hemimegalencephaly who showed BS pattern on the EEG before surgical operation. Finally, we selected 6 patients revealed with the clinical and EEG characteristics of EIEE, who performed hemispherotomy during 2001 to 2012. The follow-up period is 83 months from 13 months. The age of seizure onset is 2 months from 6 hours of life.
Results: Seizure started by 1 month of life in 5 of the 6 patients. Responses to anti-convulsants were all poor. The age at hemispherotomy is 4 months from 2 months of life. The period from seizure onset to hemispherotomy is 4 months from one month. Hemispherotomy was performed by 3 months after seizure onset in 4 of the 6 patients. BS pattern was identified in all cases even after hemispherotomy.
Conclusion: Although cortical and thalamic signals was disconnected by hemispherotomy, BS pattern on the EEG persisted even after the surgical operation. This phenomenon suggests the neurophysiological mechanisms of BS might not always be associated with cortical and thalamic connections. To our knowledge, there are no previous human studies concerned the changes on EEG of BS after disconnected cortical and thalamic circuit.

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Alterations in peri-ictal heart rate, ECG, oxygen saturation and blood pressure in localization related drug resistant epilepsy during video EEG recording

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Purpose: To study the changes in heart rate (HR), ECG, oxygen saturation and blood pressure (BP) in the peri-ictal period in patients with localization-related drug-resistant epilepsy.
Method: Eighty-nine subjects undergoing video EEG recording for pre-surgical evaluation underwent continuous HR, ECG, oxygen saturation and non-invasive BP monitoring. The changes in these parameters during the ictus, and one minute before and after the ictus were analysed in 55 events (n=40) with artefact-free recordings and correlated with phenotype, EEG and MRI characteristics.
Results: Ictal tachycardia was noted in 25% of the events,of which, 42.9% had temporal lobe onset. Ictal bradycardia was noted in single event with right temporal onset. Changes in HR during the preictal, ictal and postictal phases were significant (p=0.04). The frequency-domain parameters didn't show significant difference across phases. There was change in the sympathetic and parasympathetic activity across 3 phases, especially when it was grouped according to side of seizure onset (p=0.02). The overall values showed increase in sympathetic and decrease in parasympathetic activities during and soon after termination of ictus (p=0.12). Desaturation was noted in 9/55 events. There was statistically significant change inthe oxygen saturation across the phases. Ictal hypertension was observed in 14/55; ictal hypotension was noted in 5/55 events. Statistically significant difference was found in the diastolic BP from pre-ictal to ictal phases (p=0.01).
Conclusion: The present study, first of its kind to document changes in BP, HR, ECG changes and oxygen saturation during the (peri)-ictal phases in localization related epilepsy, suggesting presence of dysautonomia.

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Can saccadic eye movements detect adverse effects of antiepileptics?

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Purpose: The adverse effect (AE) of antiepileptics (AEDs) is related with poor quality of life or response to treatment. The reporting of AE may be underestimated and can be increased with adverse event profile (AEP).

Method: This study was performed prospectively in a single tertiary hospital. The inclusion criteria for this study were 1) consecutive patients with epilepsy taking AEDs regularly for at least 1 yr regardless of mono-pharmacy or poly-pharmacy, 2) absence of structural lesions on MRI, 3) age ≥ 16 years old, 4) without medication possibly influencing on eyeball movement such as benzodiazepines, 5) normal neurologic examination especially absence of nystagmus or ataxia. Latency, peak velocity and accuracy of saccade, and gain of pursuit eye movements were recorded by video-based oculography (VOG). Saccadic eye movements with fix and random target, and pursuit eye movements with 0.2 and 0.4Hz were recorded. We analyzed the difference of the parameters of eye movements between 75 patients with epilepsy and 20 normal controls matched with age and sex.

Results: Total latency and accuracy on VOG was significantly different between patients with epilepsy and normal controls [1017.7±148.9 msec Vs 1150.7±106.6 msec, p=0.0003, 370.7% (95% CI 364.1-376.4, range 306-408.2 Vs 383.6% (95% CI 378.8-398, range 322.9-417.4), p=0.0005, respectively]. Age and duration of exposure to AEDs were positively correlated with total latency (r=0.22, p=0.03 for age and r=0.25, p=0.08 for duration of exposure to AEDs), whereas AEP scores, dosage or number of AEDs were not correlated with total latency. Clear cutoff values of total accuracy (≤388.7%) and total latency (≤1005.5msec) revealed 93.4% sensitivity and 28.6% specificity for exposure to AEDs, and 49.2% sensitivity and 78.6% specificity respectively for nystagmus on VOG.

Conclusion: The total accuracy and latency on VOG may be screened for detection of the high risk patient with AE of AEDs.

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Cytokine level changes in epilepsy with hippocampus sclerosis

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Purpose: Temporal lobe epilepsy and hippocampus sclerosis. Mesial temporal lobe epilepsy is one of the most common and intractable forms of seizure disorder. And hippocampus sclerosis is common in MTLE pathology. Our study focuses on the cytokine level changes in MTLE with hippocampus sclerosis.

Method: We prospectively recruited 26 patients with hippocampus who sought treatment from November 2012 to March 2013 in the department of neurology and neurosurgery in West China Hospital. All 26 patients, aged at a median age of 23 (range from 11-64), received surgery for resection of mesial temporal lobe and hippocampus. Epilepsy was diagnosed by experienced neorologists according to 2006 International League Against Epilepsy (ILAE) Classification. And tumor, hemangioma, encephalitis and other symptomatic seizure were eliminated. Pathologic diagnosis were also made using HE dyeing. Control group was from resection of other craniocerebral operations including cerebral hemorrhage and brain trauma. Brain tissues of 32 patients, including 26 HS patients and 6 control groups were tested for 13 cytokines including IL-1A, IL-1B, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, TGF-α, TNF-α, TNF-β,

and VEGF using Real-Time PCR, which were sensitive in determining the RNA concentration of each cytokine. RNA concentration results were analysis by SPSS.
Results: Of the 13 cytokines, IL-1A, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, TGF-α, and TNF-α had higher RNA concentration than control groups, while IL-1B, IL-3, IL-9, TNF–β, and VEGF RNA concentration were tested lower than control groups. The upregulation of IL-2(P=0.043), IL-7(P=0.012), TNF-α (P=0.045) were found statistically significant (P< 0.05).
Conclusion: Our study indicates IL-2, IL-7 and TNF-α may have important role in HS development.

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Cnnectivity between bilateral temporal lobe by cortico-cortical evoked potential in temporal lobe epilepsy-based on 1 case with temporal lobe epilepsy

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Purpose: to study the connectivity between bilateral temporal lobe by cortico-cortical evoked potential in temporal lobe epilepsy-based on 1 case with temporal lobe epilepsy.
Method: to study the connectivity between bilateral temporal lobe by cortico-cortical evoked potential in temporal lobe epilepsy only based on 1 case with temporal lobe epilepsy.
Results: The results showed: Firstly, there were bidirectional connectivity between bilateral hippocampus. Secondly, there were only little connectivity between bilateral lateral and basal temporal regions. that's to say only very weak connectivity between bilateral neocortical temporal regions(lateral and basal temporal regions).Thirdly, both hippocampus connected with its contralateral neocortical temporal region. But there were no obvious CCEP recorded at contralateral hippocampus when stimulated at one side neocortical temporal regions.
Conclusion: This study probably can further explain why the mesial temporal lobe discharges prefer to propagate to contralateral mesial temporal structures and ipsilateral neocortical temporal region and also demonstrated that CCEP can be used to study the functional connectivity of the brain.

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Intraoperative functional cortical mapping for the neurosurgical management of intractable perirolandic cortex epilepsy

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Purpose: Perirolandic surgery is associated with an increased risk of postoperative neurological deficit. Intraoperative neurophysiologic monitoring is useful to gain insight into the anatomy of and the relationship between pathological and normal tissue. We report on the experience of intraoperative functional cortical mapping with cortical resections in the perirolandic area in patients with intractable epilepsy.
Method: We prospectively included 10 consecutive cases of intraoperative functional cortical mapping referred between March 2011 and March 2013 at West China Hospital in China, for perirolandic lesion resection and epilepsy surgery. Volatile induction and maintenance anaesthesia (VIMA) with sevoflurane or total intravenous anaesthesia (TIVA) with propofol were used. Phase reversal of the median somatosensory-evoked potentials (MSSEPs) localized the central sulcus (CS). Motor evoked potentials (MEPs) triggered by electrical cortical stimulation delineated the primary motor cortex (PMC). Intraoperative electrocorticography (ECoG) was also performed at the time of surgery.
Results: The average age at the time of surgery was 33 years. The aetiologies were neoplastic in 5 patients (50%), vascular in 3 (30%), malformations of cortical development in 2(20%). Central

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sulcus was located in 8 patients and MEPs were recorded in 6 patients. Stimulation-induced electrographic seizure occurred in 4 patients. Immediately postoperatively, 8 patients had differing degrees of hemiparesis, from mild to severe. The hemiparesis improved in all affected patients by 3-6 months postoperatively. Seizure outcome in 7 patients (70%) was Engel Class I and seizure outcome in 3 (30%) was Engel Class II by 1 year postoperatively.
Conclusion: Staged multimodal intraoperative neurophysiology can be used under general anesthesia to guide resection of epileptogenic lesions involving the perirolandic area.

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Neurophysiologic studies and MRI correlation of Krabbe's disease in a Chinese boy
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Purpose: To compare the neurophysiologic studies and MRI findings in a Chinese boy with early infantile Krabbe's Disease for disease severity correlation.
Method: Case report and literature review.
Results: A 4 year old boy with developmental regression since 5 months old was confirmed to have early infantile Krabbe Disease by leukocyte galactocerebrosidase activity and GALC gene mutation. His clinical condition progressed from Hagberg stage 1 to 2 and 3 at 9 months ,14 months and 20 months respectively.
Serial MRI brain showed hyper-intense T2 signal in periventricular white matter at 9 months, diffuse bilateral white matter changes sparing gray matter at 14 months, and progressive white matter changes and diffuse cerebral and cerebellar atrophy at 17 months.
Serial EEG at 9 months, 14 months and 4 years showed progressive changes from mild posterior slowing, to background slowing with bilateral paroxysmal spike and waves, to diffuse arrhythmic delta with multifocal spike and waves.
Brainstem Evoked Potentials (BAEP) and Nerve conductions study (NCS) were abnormal at 10-14months. Flash Visual Evoked Potentials at 10 months was normal.
Conclusion: The finding of abnormal NCS, BAEP and EEG early in the course of disease is consistent with previous study. The early appearance of bilateral paroxysmal synchronous discharges, reported to be suggestive of cortical/ subcortical involvement , before MRI appearance of gray matter changes, suggests that EEG may be more sensitive than MRI in detecting early gray matter involvement in this condition.

p119
Evaluating the cortical excitability with transcranial magnetic stimulation in persons with complex partial seizures
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Purpose: In this preliminary study, we evaluated cortical excitability with transcranial magnetic stimulation (TMS) in persons with complex partial seizures and healthy controls. We proposed that the degree of cortical excitability inversely correlated with the degree of seizure controllability.
Method: We prospectively recruited 3 groups of subjects: normal control (NC), persons with complex partial seizures under well-controlled (WC) and poor-controlled (PC) state. NC was composed of age-matched healthy persons. Persons in WC maintained seizure free under antiepileptic drug(s) for at least 2 years and PC patients had poor seizure control. The subjects underwent standard 30-min sphenoid electroencephalography (EEG) recording and TMS proto-

col in the same day. MEPT (motor evoked potential threshold), MEPA (motor evoked potential amplitude), SICI (short intracortical inhibition) and LICI (long intracortical inhibition) during TMS are calculated for the evaluation of cortical excitability.
Results: We recruited 44 patients in NC group (M/F 21/23), 71 patients in WC group (M/F 45/26), and 42 patients in PC group (M/F 19/23). The mean age was 37.6, 38.5 and 38.7 year-old, respectively. MEPA had a tendency to decrease, while MEPT tended to increase in the order of NC-WC-PC. As to SICI and LICI, post hoc tests showed that SICI of NC and PC groups were similar and larger than that of GC group, while LICI of WC and PC groups were similar and smaller than that of NC group.
Conclusion: This preliminary result may support the utility of TMS in the prediction of seizure controllability. Further correlation of current medication, sphenoid EEG presentation and clinical follow up is undergoing.

EEG

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Subacute dclerosing panencephalitis: revisit to typical Rademecker complexes in electroencephalography
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Background: Subacute sclerosing panencephalitis (SSPE) was regarded as "vanishing" devastating brain disease. Nonetheless, with increasing rates of wild-type measles worldwide from decreased vaccination compliance, it is anticipated that SSPE occurence will remain. Therefore, it is important for medical staff to recognize this epileptic encephalitis. We describe a case of SSPE presenting with loss of ambulation, visual impairment, and myoclonic jerks. Diagnosis was clinched by characteristic electroencephalograpic (EEG) complexes and confirmed by elevated cerebrospinal fluid (CSF) measles antibody titre.
Case description: Our patient is a previously well 10 year-old Pakistani boy presenting in stage II-III SSPE, with visual loss, refractory myoclonic jerks and neuroregression. He had presumed measles infection manifested as fever, cough, coryza, and rash at 2 years old. No record of measles vaccination. He had 7 months history of worsening headache, subsequent academic deterioration, poor memory and hand writing with decrease attention span. He developed blurring of vision, tremors, unsteady gait, and myoclonic seizures. Behavior was appropriate except for intermittent periods of visual hallucination and incongruent speech. He had multiple truncal myoclonic jerks, supranuclear gaze palsy, increased limb tone, and mild tremors. Ambulation was lost 2 months after onset of symptoms. MRI brain showed bi-occipito-parietal lobe white matter changes with increased choline and creatine on MRS. Visual evoked potentials revealed marked delay in P100 latencies bilaterally. EEG at 5th month of illness showed disorganized background with periodic Rademecker complexes in sleep. Repeat EEG recorded stereotyped discharges appearing also when awake and were "timed locked" with each myoclonic jerk. Significant titer of CSF measles IgG antibody was detected. Isoprinosine and anti-epileptic medications were commenced.
Conclusion: The basics of EEG pattern recognition for this rare but clinically significant neurologic condition are essential in obtaining a quick diagnosis. Limited intervention in terms of antiviral and interferon may modify disease course.

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Analysis of epileptic discharges using implanted subdural electrodes in patients with Sturge-Weber syndrome

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Purpose: Sturge-Weber syndrome (SWS) is a congenital neurocutaneous disorders with portwine nevus, glaucoma, and leptomeningeal angioma of the brain. Almost half of the patients with SWS have epilepsy, and some need epilepsy surgery. However, the epileptogenicity of SWS has never been elucidated. Difficulty to find out the mechanism of epileptogenicity in SWS is due to the fact that scalp EEG's does not show apparent epileptic discharges. In this study, we analyzed interictal and ictal discharges from intracranial subdural EEG recording of patients with SWS to elucidate epileptogenicity in SWS.
Methods: Five patients aged from one to 9-year old were enrolled in this study. The patients had intractable seizure and mental retardation. After the non-invasive diagnostic protocol for epilepsy, we implanted subdural electrodes over the leptomeningeal angioma. An investigator who did not know patient's background evaluated the interictal and ictal discharges by visual inspection. We examined the followings, seizure onset zone, seizure propagation speed, and seizure duration.
Results: We recorded 21 seizures from invasive EEG monitoring in five patients. Usually the seizures presented as motionless staring and respiratory distress. All the seizures started from the cortex under the leptomeningeal angioma. Average seizure propagation speed was 3.1 ± 3.6 cm/min, and seizure duration was 17 ± 29 minutes.
Conclusion: Seizures of patients with SWS was inconspicuous, seizure propagation was very slow and seizures duration was very long period. Invasive EEG monitoring is one of the tools for elucidating epileptogenicity of SWS.

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Yield of recording EEG status epilepticus in patients in critical care setting

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Purpose: To determine the yield of recording EEG Status Epilepticus from patients in critical care setting.
Method: EEGs performed in critical care setting between January and December 2013 for the evaluation of encephalopathy were retrospectively reviewed to identify presence of EEG Status Epilepticus (SE).
EEG SE was defined as having (a) continuous ictal discharges lasting >5 min - Pattern 1 or (b) >2 discrete bursts of ictal discharges, each lasting < 5 min, without returning to previous background rhythm in between these bursts - Pattern 2. Each EEG was recorded for at least 30 minutes.
Results: 179 EEGs were performed from 128 patients in critical setting during this period. Of these, 23 EEGs (12.8 %) from 15 (11.7%) patients satisfied the EEG criteria for SE.
4 (17.4%) patients were in coma, 10 (43.5%) were in stupor, 9 (39.1%) were in lethargic state.
4 EEG from 4 patients showed Pattern 1 while 19 EEGs from 13 patients show Pattern 2 and 3 EEG from 2 patients showed both patterns. Ictal onset was regional in 15 (65.3%) EEGs, multi-regional independent in 3 (13.0%) EEGs and generalized in 5 (21.7%) EEGs.
In 12 (52.2%) EEGs, the SE were not associated with clinical manifestations.
Conclusion: Using predefined EEG criteria that were similar to clinical definition of SE, EEG could aid the diagnosis of SE, as half of the patients had no clinical manifestation. Furthermore, majority of SE were focal, indicating a need for neuroimaging studies to look for focal abnormality as the cause of SE.

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Significance of triphasic waves in metabolic encephalopathy

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Purpose: Triphasic waves are one of the electroencephalographic patterns that can be usually seen in metabolic encephalopathy. The aim of this study is to compare the clinical and electrophysiologic profiles between patients with and without triphasic waves in metabolic encephalopathy, and reassess the significance of triphasic waves in metabolic encephalopathy.
Method: We recruited 127 patients with metabolic encephalopathy, who were admitted to our hospital. We divided these admitted patients into two groups; those with and without triphasic waves. We analyzed the difference of duration of hospitalization, mortality rate during admission, Glasgow Coma Scale, severity of electroencephalographic alteration, and presence of acute symptomatic seizures between these two groups.
Results: Of the 127 patients with metabolic encephalopathy, we excluded 67 patients who did not have EEG; finally 60 patients met the inclusion criteria for this study. Patients with triphasic waves had more severe electroencephalographic alterations, lower Glasgow Coma Scale, and more acute symptomatic seizures than those without triphasic waves. After adjusting the clinical variables, Glasgow Coma Scale and acute symptomatic seizures were only significantly different between patients with and without triphasic waves.
Conclusion: We demonstrated that patients with triphasic waves in metabolic encephalopathy had more significant impairment of the brain function.

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Comparison between EEG trending and conventional EEG to detect seizure in adult routine EEG recordings

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Purpose: Seizure detection with EEG is important to confirm seizure diagnosis. EEG trending is an EEG signal analysis application which provides unique graphical perspective and facilitates detection of seizures. The objective of this study is to compare EEG trending to conventional EEG for seizure detection in adult routine EEG recordings.
Method: This is a cross-sectional study which included 36 adult routine EEG seizure recordings from June 2010 to September 2013 at EEG Laboratory dr. Hasan Sadikin Hospital, Bandung. We use NicoletOne EEG machine which has been preinstalled with EEG trending software which consists of total power trend (TPT), envelope trend (ET), relative band power (RBP) and absolute band power (ABP). Collected data are statistically analyzed using Friedman comparison testing and Spearman correlation testing. Numbers of seizure detected with EEG trending are then compared to conventional EEG interpreted by a certified EEGer.
Results: Multivariate analysis using Friedman comparison testing showed significant difference between numbers of seizure detected with EEG trending and conventional EEG, in which EEG trending detected more seizures ($p < 0.05$). These are caused by artifacts detected as seizures. Spearman correlation testing showed that ET has statistically significant correlation to conventional EEG ($p < 0.05$).
Conclusion: This research showed that ET can be used as a screening tool for quick seizure detection, even though its application must be used in conjunction with conventional EEG to avoid seizure misdiagnosis or overdiagnosis.

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Prognostic value of periodic lateralized epileptiform discharges in patients with altered consciousness

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Purpose: We have found that characteristics of spikes or sharp waves differ considerably within the patients with PLEDs and these differences may affect those patients' outcome. We conducted this study to find relationships between morphologic characteristics of PLEDs and outcome of patients with PLEDs.
Methods: Among 225 patients who undertaken EEG which revealed PLEDs, 62 patients who were admitted to an intensive care unit because of altered consciousness, showed PLEDs on EEG which undertaken within 48 hours after the onset of altered consciousness, and had admitted for at least 30 days so that detailed medical records were available to evaluate the outcome, except when the patient died or fully recovered within 30 days, were enrolled. Morphologic characteristics of PLEDs (amplitudes and duration of each sharp waves or spikes, and inter-peak interval) from the initial EEG were analyzed from randomly selected 20 epileptic discharges from the initial EEG records. We analyzed differences of these characteristics according to the etiology and outcome.
Results: Mean PLEDs amplitude from all 62 patients was 140.46 μV (ranged 27.66-507.79 μV). 20 patients (32.3%) were fully recovered, 15 (24.2%) were partially recovered, 11 (17.7%) were not changed from their initial neurologic state, and 16 (25.8%) were died within 30 days. PLEDs amplitude was significantly higher in patients who died. Patients with metabolic encephalopathy had significantly higher mortality than those with cerebrovascular disease. PLEDs amplitude was not different according to these etiologies. Among 26 patients with metabolic encephalopathy, PLEDs amplitude was significantly higher in patients who expired within 30 days. Among 30 patients with cerebrovascular disease, however, PLEDs amplitude was not different according to their outcome.
Conclusion: Higher amplitude of PLEDs predict higher early mortality.

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Diagnostic yield of inpatient video electroencephalographic monitoring: experience from a Chinese comprehensive epilepsy center

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Purpose: To determine the utility of VEEG in our center.
Method: The study retrospectively reviewed the charts of 484 consecutive patients who were admitted to our center between July 2012 and September 2013.
Results: Of these patients, 298 (61.6%) were admitted for diagnostic clarification and underwent VEEG for a mean duration of 1.3 days (range, 1-9 days). The patients were divided into two groups: those whose diagnosis was changed and those whose diagnosis was not changed as a result of VEEG monitoring. A patient with a pre-admission diagnosis of epilepsy who was discharged with a diagnosis of nonepileptic events (NEEs) or who were further classified as focal/generalized epilepsy on discharge was included in the "change in diagnosis" group. A patient admitted with an uncertain diagnosis and discharged with a diagnosis of NEEs or epilepsy (including focal epilepsy and generalized epilepsy) was also included in the "change in diagnosis" group. In total, 181 patients (60.7%) had a change in diagnosis after VEEG. Among them, 103 patients (56.9%) had a pre-admission diagnosis of epilepsy, which was further classified as focal epilepsy (88 patients) or generalized epilepsy (15 patients); the diagnosis of NEEs and epilepsy

was clarified in 78 patients (43.1%). The number of patients diagnosed with NEEs increased from 31 (10.4%) on admission to 88 (29.5%) on discharge. Among all the patients admitted for a diagnostic clarification, therapeutic plans were changed for 104 patients (57.5%). In 117 patients (39.3%) with no diagnostic change, VEEG evaluation provided confirmative diagnostic information in 47 patients (15.8%) and no additional diagnostic information in 70 patients (23.5%).
Conclusion: The study indicates that VEEG is useful in terms of clarifying seizure diagnoses and evaluating seizure frequency. In our study cohort, VEEG of a relatively short mean duration produced a comparable diagnostic yield as that reported in other studies.

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Ripples and waves in absence epilepsy: high frequency oscillations (HFOs) in scalp EEG
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Purpose: To look for occurrence of HFOs (80-250 Hz) in scalp EEGs among patients with absence epilepsy, their frequency bandwidth and spectral analysis and their spatial-temporal distribution.
Method: Seven patients with absence epilepsy (CAE-6, JAE-1; M:F=3:4; age=9.7±4.6 years; age at onset: 7±3.2 years) were evaluated with scalp EEG (sampling rate: 2048 Hz) in the GalileoNT® system using standard procedures. The finite impulse response (F.I.R) filters on the longitudinal bipolar montage were adjusted to a band pass of 80 - 250Hz using EEGLAB and Cartool software. Sensitivity and paper speed were modified accordingly to study the HFOs. Five hundred and two HFOs noted in 911 artifact free generalized seizure discharges were analyzed. Ictal SW discharges were defined when there was clinical absences and lasted for >6 seconds.
Results: The HFOs were associated with inter-ictal generalized spike-wave discharges (IIG-SWDs-76/288), ictal GSWDs (IcGSWD-382/530), sporadic GSWDs (sGSWDs-44/83). HFOs were not associated with occipital intermittent rhythmic delta activity (34 runs). IcGSWDs had more HFOs when compared to IIGSWD ($\chi 2$ = 156, d.o.f. =1, OR=7.2, 95% CI: 5.2-9.9, $p < 0.0001$). The onset of HFOs was temporally related to the spike component and not to slow waves. Spherical head dipole modelling of the HFOs associated with IIGSWDs and IcGSWDs were located in fronto-centro-parietal regions. Power spectral analysis of HFO epochs in sleep revealed power maxima at 130Hz.
Conclusion: This study on HFOs in absence epilepsy, first of its kind enhances the spectrum of understanding of electrophysiological changes. Future studies with ICA and simultaneous EEG-fMRI might improve the understanding of the centrencephalic vs. neocortical origin of generalized seizures.

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Clinical utility of a pediatric EEG database
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Purpose: To describe the clinical indications and EEG findings as recorded by our EEG database at KK Women's and Children's Hospital (KKH).
Method: A computerized EEG database has been used at our institution since 2007 to record clinical indications, neurophysiological findings and epilepsy syndrome diagnosis. We reviewed recordings from 2011-2013 to determine the clinical utility of EEG at our institution.
Results: A total of 1680 EEG recordings were performed. Indications were: afebrile seizure 52%, refractory seizure 16%, involuntary movements 6%, syncope 6%, encephalopathy 6%, febrile seizure 4% and others 10%.

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EEGs were abnormal in 1231 (75%) and normal in 429 (25%). EEG patterns consistent with a recognized epilepsy syndrome/constellation were seen in 80 recordings - frontal lobe epilepsy 43%, temporal lobe epilepsy 26%, infantile spasm 19%, absence epilepsy 8% and Lennox Gastaut 4%.
The commonest EEG findings in each indication were:
Afebrile seizure - focal spikes (43%), encephalopathy - generalized discharges (45%), involuntary movements - normal (49%), syncope - normal (78%), sleep disorders - normal (46%), febrile seizure - normal 67%.
Conclusion: Two-thirds of EEGs were requested for afebrile seizures and epilepsy, with the majority reported abnormal. The commonest indication for EEG was afebrile seizure, with epileptiform discharges seen in 66%. EEGs in febrile seizures, syncope, sleep disorders and involuntary movements are frequently normal. Diagnostic yield is highest in afebrile seizures and epilepsy. Computerized EEG databases are of value in determining diagnostic utility of EEG.

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EEG studies in Myanmar children with first unprovoked seizure
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Purpose: To detect the association between clinical variables and EEG abnormalities in Myanmar children with first unprovoked seizure.
Method: A descriptive study included 87 children with first unprovoked seizure, aged range from 1 month to 12 years admitted to Yangon Children Hospital from January to December 2012. Unprovoked seizure was defined as one episode or cluster of seizure within 24 hours without any immediate provoking factors. EEG was performed to all eligible children and findings were categorized as normal or abnormal when there was either abnormal background rhythms or presence of epileptiform activities.
Results: Among 87 children, 50 (57.5%) were under 3 years and 37 (42.5%) were above 3 years with 61 (70.1%) had generalized seizure, 26 (29.9%) focal seizure. Possible risk factors were identified in 48 children(55.2%). Among 33 children (38%) with abnormal EEGs, 25 children had epileptiform discharges, 2 children had background abnormality and 6 children had both background abnormalities and epileptiform discharges. Twenty five percentage of EEGs with abnormal background were focal and 75% were generalized slowing. Among 31 children with epileptiform discharges, 22.6% had generalized and 77.4% had focal discharges. Abnormal EEG was significantly associated with seizures in children age older than 3 years and more than one seizure within 24 hours (p =0.002 and 0.037 respectively). Other clinical variables like type of seizure, etiology, neurological examination, awake/sleep state during EEG recording, interval between seizure and EEG recording were not associated significantly.
Conclusion: Children with first unprovoked seizure having abnormal EEG may need antiepileptic drugs. In situation where EEG is not available, like resource poor settings, older children (> 3 years old) with first unprovoked seizures and those with more than one seizure within 24 hours are two significant clinical parameters to consider for regular follow up and antiepileptic drugs.

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Effect of amplitude setting on seizure detection by density spectral array
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Purpose: Continuous EEG (cEEG) is a valuable tool in the diagnosis and management of

refractory status epilepticus (RSE) but requires intensive skilled interpretation. Density spectral array (DSA) is a widely available, quantitative analytic tool which has promising use in screening cEEG for seizures. The optimal amplitude range of DSA colour scales for seizure detection has not been previously determined. Hence, we studied the effects of different amplitude settings (in terms of maximal voltage) on seizure detection with DSA.
Method: Five 12-hour excerpts from paediatric cEEG recordings with RSE were identified. Four DSA readers (2 EEG technologists and 2 electroencephalographers), who were blinded to raw cEEG tracings, were asked to compare pairs of DSA displays from each excerpt with progressively smaller differences in their maximal voltages until they arrived in the optimal voltage. Readers then marked all seizures in one excerpt using their preferred setting. Intraclass correlation of the chosen maximal voltages and inter-rater agreement on the seizure markings were assessed.
Results: There was large variability in the optimal amplitude setting chosen by the DSA readers for the same excerpt (intraclass correlation coefficient = -0.233, p = 0.909). The chosen maximal voltages for one excerpt ranged from 3 to 100 μV; nonetheless, the seizure markings by different DSA readers demonstrated high inter-rater agreement (overall Fleiss kappa = 0.81). Furthermore, sensitivity of seizure detection by individual readers ranged from 73.3% to 100%, and specificity of 100% was achieved by all.
Conclusion: Seizure detection on DSA is not affected by amplitude setting. High sensitivity and specificity can be achieved across a wide range of amplitude values. This can aid generalizability of DSA research findings in future studies.

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Finding a proper special characteristics model for early detections on epileptic seizures
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Purpose: Early detections of possible seizures on epileptic patients are expected for their better treatments. The research was based on some long term, 72 hours, EEG signals from 17 males and 10 female ages 3 to 55 years.
Method: To increase the their Signal-to-Noise Ratios four bandpass filters were applied ranging 0 to 4 Hz (delta), 4 to 8 Hz (theta), 8-13 Hz (alpha), and 13-30 Hz(beta). A number of Wavelet Transforms (special characteristics) were applied to acquire an idea on the best suited specific wavelet from especially with regard to epileptic seizures. For this a mother 3.7 biorthogonal wavelet was employed and the resulting statistical data namely the means, standard deviations, skewneses, kurtosises, as well as entropies were compared from normal persons and epileptic patients.
Results: The representing number of magnitude 26.57 from normal person and 80.17 from epileptic patients and means 3.24, mean standard deviations 102.23, mean skewneses 0.21, mean kurtosises 2.31, mean entropies 2.03 from normal person and means -144.22, mean standard deviations 312.11, mean skewneses -0.29, mean kurtosises 3.32, mean entropies 2.42 from epileptic patients. Besides, this algorithm can achieve the sensitivity of 95.75% and specificity of 92.24% total accuracy of 92.27% .
Conclusions show suggest that it is possible to detect epileptic seizures as early as possible.

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Chloral hydrate versus melatonin as the sedative in sleep electroencephalograms in Chinese paediatric patients

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Purpose: To compare the epileptic discharges detection rate in sleep EEGs between the use of melatonin and chloral hydrate as the sedative agent.
Method: This study is a retrospective study performed in a Paediatrics department in a regional Hospital in Hong Kong under the routine EEG protocol. Sedation was given when the patients were uncooperative with the EEG setup or referred for sleep EEG. Chloral Hydrate was used before Oct 2012. Melatonin was introduced as the new sedative agent after Oct 2012. All patients undergoing EEG between Oct 2011 to Oct 2013 requiring sedations were included in the study with Chloral hydrate used in the first 12 months and Melatonin in the second 12 months Each group contains 40 patients with comparable demographic features with age ranging from 2 weeks to 18 years old. All the EEGs in the two periods were interpreted by the same paediatric neurologists. The number of abnormal results in terms of the presence of epileptic discharges are identified in both groups. Secondary outcomes including failure rate of sedation and side effect profiles were also assessed.
Results: Epileptic discharge in EEG appeared in 20% and 57% of the Chloral hydrate group and Melatonin group respectively. (P=0.02).
Conclusion: The result showed a higher epileptic discharge detection associated with Melatonin sedation favours its use over Chloral Hydrate.

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Prevalence and significance of Sub clinical rhythmic electrographic discharges in adults (SREDA)

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Purpose: To assess the prevalence, pattern and implication of Sub clinical rhythmic electrographic discharges in adults (SREDA).
Methods: All Electroencephalography (EEG) studies done in our lab during the period September 2010 to September 2013 were included for this study. The recording was done according to international 10-20 electrode placement with bandwidth 0.5Hz-70Hz (Nicolet One M40, USA). Recording time was standardized to forty minutes. All benign epileptiform variants; especially Subclinical rhythmic electrographic discharges of adults (SREDA) were categorized and detailed analysis done according to the descriptions of Westmoreland and Klass (Electroencephalogr Clin Neurophysiol 1997; 102:1-4). Follow up study for those patients having SREDA was done at regular interval.
Results: A total of 4436 EEGs were analyzed. Two cases (1 Male,1 Female) found to have SREDA (0.05%). Both patients had history of intermittent episodes of confusional states without any neurological deficit and normal magnetic resonance imaging study of brain. Patient responded to all commands during the SREDA. On follow up none of them developed seizures. SREDA was persistent during the follow up study also.
Conclusion: SREDA is a rare rhythmic electrographic pattern of unknown significance. They abide a similarity to epileptic seizures due to their epileptiform facade but are not true epileptiform abnormalities A diligent interpretation of EEG is essential in order to avoid its misinterpretation as seizure discharges. It occurs mostly in adults and tends to be persistent. In majority of previous

observations SREDA consists of EEG frequency is in the range of 4-7 Hz without any evolution in the morphology, frequency, amplitude and well expressed over the parieto-posterior temporal areas. More case reports and follow up studies are required to resolve the ambiguity.

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Interictal EEG findings in Mongolia patients with partial epilepsy

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Purpose: EEG control of effect carbamazepine (CBZ) in patients with partial epilepsy.
Method: 80 patients partial epilepsy: 44 males and 36 females included in the study. The average age was 31.3 ± 8.4 (range 20-50 years). The mean duration of partial seizure was 8.4 ± 4.8 years. The seizure onset was 18.25±9.2 years. Patients were follow - upped during 6 months. Initial dose of treatment was 8.2 ± 2.8 mg/kg. EEG examination: Routine digital 19 channel interictal scalp EEG (Encephalon 131-03) were performed before and after CBZ monotherapy. Mean percent of power spectral analysis of background activity and slow potentials were obtained before and after treatment. Meanwhile interictal epileptiform discharges were counted in each patient also. Treatment effect was estimated based on EEG descriptive and spectral analysis.
Results: In Interictal EEG in patients with partial epilepsy background activity lower than in control group. Dominated diffuse slowing in frontal area is indicated that frontal cortex is more sensitive in epilepsy (p< 0,001). Teta wave decreased from 66.25±21.5 mcv2 to 32.39±16.27 mcv2 and delta wave from 56,25±14.12 mcv2 to 24.24±14.12 mcv2 before and after monotherapy treatment in experimental group comparatively with control group (*p< 0,001). In experimental group non-specific slow waves in EEG were detected in 66% patients before the treatment. Epileptiform discharges like as SW or SSW were in 73% patients before the treatment and these reductions were noticed after the treatment in 45.4% patients. From all patients in 63.34 % EEG was showing epileptiform discharges.
Conclusion: Epileptiform discharge significantly reduced in patients from experimental group after the affordable medication. There were significantly decreased teta (t=7.8, p< 0.001) and delta (p< 0.001) waves by EEG spectral analysis. Teta wave (t=7.8, p< 0.001) and delta wave (p< 0.001) significantly decreased after monotherapy treatment in experimental group comparison to control group (p< 0,001).

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EEG findings when seizures are suspected in the intensive care unit

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Purpose: To determine the likelihood of epileptic seizures or nonconvulsive status contributing to impaired consciousness and/or abnormal movements in an adult general intensive care unit (ICU).
Background: Impaired consciousness and abnormal movements are common in the critically ill, and a key concern is that seizures may be the cause or contributor. Diagnostic EEG recordings can provide clarification. Previous EEG studies have described varying findings and interpretations.
Method: We retrospectively analysed the diagnostic EEGs of 337 consecutive patients performed in an adult general ICU. The indication for EEG was suspected seizures, 26% with recent definite clinical seizures and 23% after hypoxic brain injury.
Results: Fourteen patients (4.2%) had seizures recorded on EEG, 3 in non-convulsive status epilepticus. Nine patients (5.5%) had seizures without clinical accompaniment, eight already

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with recent clinically definite seizures (3 in status) and on parenteral AEDs (7 polytherapy). The single exception had hypoglycaemic encephalopathy and EEG showed stimulus-induced rhythmic, periodic, or ictal discharges (SIRPIDs), the treatment and prognostic implications of which are unknown. In 5 patients the seizures had a clinical accompaniment, all of these patients already had had clinically definite seizures and had received parenteral AEDs. Abnormal movements unrelated to seizures occurred in a further 80 patients, and EEGs showed: generalised/focal slowing (41); PLEDs (10); triphasic waves (9); GPEDs (13) or suppression-burst (5) related to post-anoxic encephalopathy; psychogenic events (3); and interictal generalised spike and wave (1).
Conclusion: A small minority of ICU patients have inapparent seizures contributing to decreased consciousness, all with recent clinically definite seizures. Similarly, a small minority of patients with abnormal movements suspected of being seizure are having seizures. For most ICU patients, EEG mainly excludes the diagnosis of seizures, and can prevent inappropriate overtreatment.

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Seizure focus delineation and pre-surgical evaluation of an epileptic cortex using an in *silico* approach
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Purpose: A third of patients with epilepsy are refractory to anti-epileptic drug treatment. For some of these patients with focal epilepsy better seizure control can be achieved by surgical treatment in which the seizure focus is localised and resected while avoiding the eloquent cortex. A key challenge is to predict the likelihood of seizure reduction following the resection of particular areas.
Method: In this study, we use a phenomenological computer model of transitions to seizure like dynamics. The connectivity of the model is underpinned by patient data. We simulate the model and predict the likelihood of a seizure. We then resimulate the model with the resection of specific regions and again predict the likelihood of a seizure.
Results: We find that regions, which are more likely to transit into a seizure like state in the model, correspond with those identified by clinicians as the seizure onset zone. We also find that the resection of these regions in the model reduces the likelihood of a seizure overall. However, the extent of the reduction varies between patients. Essentially, surgery in the model is more successful using some patient's data than others, hence predicting the absolute likelihood of surgical success in a quantitative manner.
Conclusion: The methods presented here may aid clinicians to delineate the seizure focus. Moreover, it may facilitate neurosurgeons in predicting the likelihood of a surgical success and to investigate alternative cortical tissues to operate on if the seizure focus is in the eloquent cortex.

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Automated localization of the seizure focus using inter-ictal intracranial EEG
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Purpose: Up to 30% of epileptic patients have seizures poorly controlled with anti-epileptic drugs alone. Surgical therapy might be beneficial to patients who respond poorly to drug treatments. It is therefore crucial to accurately localize the seizure focus. Neurologists rely heavily on seizures to determine the focus. The invasive recordings usually continue for days or weeks, which is costly and entails significant risk for the patient. In this work, brief inter-ictal iEEG recordings are

used to determine the seizure focus. Our analysis shows that inter-ictal iEEG recordings contain significant relevant information about the seizure focus. Neurologists may rely on brief inter-ictal iEEG to delineate the seizure focus, which would reduce the time of hospitalization for intractable epileptic patients.
Method: The problem of localizing focus can be considered as binary classification. In this work, building upon our earlier results (J. Dauwels et al. EMBC 2009; 2180-2183, J. Dauwels et al. ICASSP 2011; 745-748,), we include two new features: ripples and inter-ictal spikes, in combination with slowing, cross-correlation and phase synchrony, to localize the seizure focus. Adaptive boosting algorithm was applied to perform leave-one-patient-out cross-validation to test all possible combinations of features. Novel method was developed as well for ripple detection.
Results: Our numerical results show that combining features results in more accurate predictions. However, adding more features does not seem to always improve the performance. In the combination of features with the best performance, the accuracy is more than 80% for 11 of 14 patients. Our results seem to be state-independent, which are similar for periods where the patient is either awake or asleep.
Conclusion: Techniques were proposed to automatically localize the seizure focus using brief inter-ictal iEEG recorded by depth electrodes, by exploiting various iEEG features. Including additional iEEG features may lead to better results.

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Characteristics of the ictal and interictal AEEG on frontal lobe epilepsy
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Purpose: To analyse the clinical features and AEEG abnormalities.
Method: We studied clinical features and characteristics of AEEG in interictal phase as well as ictal phase of 36 patients in our department from May 2008 to June 2012.
Results: The main seizures patterns included focal clonical seizures, asymmetric tonic seizures, pseudorolunfary movement, occasional absence seizures and gelastic seizures . In 13 cases, the burst abnormal rhythm in frontal region appeared in 5-20s before clinical atracks,12 of 36 whose ictal EEG having no abnormalities or rarely some frontal slow waves. Interictal EEG could be localized in frontal region in 20 patients (55.5%);in frontal and temporal region in 8 patients (22.2%), in normal EEG in 6 patients (16.6%);in Rolandic lobe in 2 patients (1.2%).
Conclusion: The clinical manifestations of FLE were complex with outstanding motor symptoms and rapidly generalized .The epileptiform discharges were complex and varied patterns in the spread of seizures discharges ,which explained the variability in the clinical and EEG manifestations of frontal lobe seizures.

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Knowledge, attitude and patients satisfaction towards services of electroencephalography in Srinagarind Hospital
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Background: There are no studies have been conducted on knowledge, attitude and patients

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satisfaction towards services of routine electroencephalography (EEG) in Srinagarind Hospital in Thailand.
Methods: We collected data by questionnaire from all of patients and their caretakers or relative, who attended the Electroencephalography Unit, Srinagarind hospital between March 2011 and June 2012.
Results: A total of 258 participants. Most were females (63.57%).The mean age of the participants was 36.78±12.17 years old (Min =18, Max= 70). Most (92.22%) were consults for routine EEG from Epilepsy clinic and 7.87% from Psychiatric clinic. Waiting time for EEG service average 30.34±38.69 minute .The mean score knowledge of EEG was 5.82 ± 2.29 (Min= 0, Max =12).Participants thought that EEG was electrification of the probes into the brain (51.55%) and thought that before EEG performed, patients must takeoff all metals from the body (44.57%). Participants thought that EEG cannot performed in pregnant by 43.8%. Perceived that EEG was to be a painful procedure (34.8%). Participants thought that must stop antiepileptic drugs before undergo EEG (28.0%).Overall satisfaction towards services of EEG were good (4.16 ± 0.40). Attitude towards services of EEG were moderate (3.4 ± 0.81).
Conclusion: Provide information about routine EEG procedure and developed a system of patients appointments are need for improve knowledge, patients' satisfaction and positive attitude toward EEG.
Key words: electroencephalography, knowledge, attitude, patients' satisfaction

Epidemiology

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Study of prevalence of uncontrolled seizures in patients with juvenile myoclonic epilepsy and its responsible factors in a rural based neurology clinic in Western India
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Purpose: To study prevalence of uncontrolled seizures in patients with juvenile myoclonic epilepsy [JME] and assess factors responsible for it.
Methods: A retrospective analysis of all new patients with epilepsy attending neurology and epilepsy clinic of Shree Krishna Hospital [a rural based medical teaching hospital in Western India] between 1 January 2009 to 28 February 2014 was done.
Results: Amongst 876 patients with epilepsy, JME was present in 73 patients [8.3%] [33 male, 40 female] [mean age 27] range (6-57). Amongst JME patients, 53 [72.6 %] had uncontrolled seizures [> 1 generalized tonic clonic seizure/year or >1 myoclonic jerk/month] prior to neurology consultation. Factors responsible for uncontrolled seizures were analyzed.
Pitfalls in diagnosis were: absence of prior neurology consultation [in 42 (81.1%], missed history of myoclonus in prior consults [39 (73.5 %)], prior EEG showing focal discharges [in 15 (28.3 %)], being normal [in 16(30.1 %)], EEG misinterpreted in 10(18.8%).Only 6(11.3) % patient were diagnosed to have JME prior to consultation.
Pitfalls in management were: incorrect anti-epileptic drug use [in 37(69.8%)], under dosing of AED (in 21(39.6 %)], non-compliance with lifestyle (in 24(45.3%)], noncompliance with medicines[in 18(33.9%), associated psychogenic non-epileptiform events [in 9(16.9%)], patients deliberately missing medicines for secondary gain (in 8(15.1%)],concomitant alternative medicine use [in 18(33.9%)]. 45(84.9 %) patients had "pseudo-refractoriness" [seizures were completely controlled after neurology consultation, counseling, rational medication and lifestyle modification]. True refractoriness [seizures despite 2 correctly dosed rational drugs] was seen in

8(15.1%) patienonly.
Conclusion: Though JME is a "benign" syndrome, three-fourth of patients in developing countries /rural areas have uncontrolled seizures, predominantly due to pitfalls in its diagnosis and management. Patient awareness and counseling, as well as primary physician training about diagnosis and treatment of JME is the need of hour to improve quality of epilepsy care in rural/ developing regions.

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Profile of patients attending epilepsy clinic in territiary care hospital in North Coastal Andhra Pradesh over twelve years

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Purpose: The purpose of the study is to retrospectively study the profile of the patients attending the epilepsy clinic of a territiary care hospital in North Coastal Andhra Pradesh, India.
Methods: Epilepsy clinic is started in January 2002 in Neurology OPD of Andhra Medical College, Visakhapatnam. All the patients with epilepsy were recorded in a Register. The profile of the patients attending the Epilepsy Clinic between January, 2002 and December, 2013 were retrospectively analyzed.
Results: There were 7388 patients who were registered which accounts for 6.78% of all the patients attending the Neurology OPD. 59.89% were males and 40.11% were females. 36.56% are from Urban areas and 63.43% are from Rural areas. 11.15% are in age group of 0-10 years; 34.71% between 11-20 years; 28.76% are 21-30 years; 13.49% are 31-40 years and 12.13% are above 40 years. 9.7% reported within one week of seizure onset; 7.85% within one month; 20.09% within one year; 16.37 had epilepsy from 1-3 years and 46.01% had for more than three years. 9.41% patients reported with single seizure. 14.18% had epilepsy for more than ten years. 63.6% presented with GTCS; 25.76% with secondary generalized seizures; 6.37% with only partial seizures; 4.77% had myoclonic seizures and only 1.15% had absence seizures. 53.06% were on Phenytoin Sodium; 21.06% were on Carbamazepine; 12.83% on Sodium Valproate and only 0.2% were on Phenobarbitone. Coming to newer drugs, 0.18% were on Oxcarbamazepine; 0.29% on Levetiracetam and 0.4% on Lamotrigine. 32.46% were on combination therapy.
Conclusion: Epilepsy is a common problem in Neurology OPD of Tertiary Care Hospital and around 50% of the patient population had chronic epilepsy for more than three years. The clinical significance of the profile of epilepsy patients attending the epilepsy clinic in North Coastal Andhra Pradesh will be discussed.

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Etiology and outcome of infantile spasms at Queen Sirikit National Institute of Child Health

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Infantile spasms (IS) are one of the most malignant epileptic syndromes that are rare condition. There are a lot of IS at QueenSirikit Institute of Child Health (QSNICH). We study the causes and clinical outcomes of these patients to develop the guideline of treatment for these patients.
Objective: To study the causes and clinical outcomes of patients with IS.
Methods: This is a retrospective study in patients who were diagnosed as IS aged 1 month to 15 years of age by pediatric neurologists at QSNICH between January 1998 and December 2007. Demographic data, age at the onset and started treatment,neuroimaging finding, the causes of IS and clinical outcomes were extracted from medical records.

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Results: There were eighty-five patients diagnosed as IS during study period. Forty-nine patients (57.6%) were male and the duration age of onset was between 1 and 22 months. Sixty-one (71.7%) patients had developmental delay was found at onset IS with 49 (57.6%) symptomatic epilepsies which identified postnatal etiologies and congenital brain anomalies in order. Because of thedifficulty to control seizure, multidrug therapy are usually use. Forty-one (48.2%) patients could be controlled IS with seventeen (20%) idiopathic or cryptogenic epilepsies and twenty-four (28.2%) symptomatic epilepsies.
Conclusion: Because of the poor prognosis of IS, treatment is usually starts quickly and aggressively after diagnosis with start to specific treatment to decreased refractory IS, mental retardation and other neurodevelopmental disabilities with improved quality of life. Future will be necessary to develop newly treatment with good clinical outcome in IS.

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Incidence of seizure disorder associated with solitary cysticercus granuloma: a study among children accessing government schools in South India

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Purpose: Solitary cysticercus granuloma (SCG), degenerative phase of cysticercus, is the most frequent presentation of NCC in the Indian subcontinent. There are no incidence studies of seizure disorder associated with SCG.
Methods: Study cohort included 7,408 children registered on rolls as on January 1, 2006 in 19 randomly selected government primary schools, adopted by NICE foundation, in Hyderabad district, Andhra Pradesh a province in south India. Mostly these children were from low socioeconomic strata and from slums. The cohort was followed for the incidence of new-onset epileptic seizures from January 1,2006-December 31,2012. Students admitted after January 1, 2006 were excluded from the study. All efforts were made to collect the data of dropout students with the help of School Teachers and co-coordinators of NICE Foundation. All children had neurological evaluation, EEG, and non-contrast and contrast CT scans. Seizure type was dichotomized into focal and generalized. The CT imaging criteria adopted for the diagnosis of SCG were that proposed by (Singh et al Neurology 2010;75:2236-45). Seizure disorder associated with SCG were categorized
Results: During the study period 58 children had new-onset epileptic seizures, 19 (32.75%) with seizure disorder associated with SCG. The mean age at new-onset was 9.42 (range 7-13) years and gender distribution was 8 boys and 11 girls. The seizure type was focal tonic-clonic with or without generalization.
The mean annual rate of seizure disorder associated with SCG was 2.7 and the annual incidence was 36.63 per 100,000. Age specific incidences for ages 5-10:30.95 per 100,000 (male:32.27; female:30.95) and for ages 11-15:60.88 per 100,000 (female:66.86; male:60.88)
Conclusion: In this high risk cohort, seizure disorder associated with SCG accounted for one third of new-onset epileptic seizures. In the absence of CT studies these children would have been categorized under epilepsy, thus projecting high incidence of epilepsy.

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Characteristics and outcomes of patients in team-based epilepsy clinic: experience from a university hospital in Thailand

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Purpose: The epilepsy clinic (EC) is a team-based clinic at Srinagarind Hospital, Thailand started since 2005. Assessment of patient characteristics and outcomes is necessary for enhancing quality of care.

Method: Patients who were serviced by the EC in 2011 were included in this retrospective analysis. Patient features and treatment outcome were retrieved from outpatient charts and a computer-based program routinely used for epilepsy care in the EC.

Results: Among 459 epilepsy patients, 382 (83.2%) were included in the analysis. A mean age of the patients was 40.4±0.8 years (15-83). Majority were female (51.1%), graduated with a bachelor degree or higher (30.9%), married (55.8%), and under the universal health coverage scheme (52.9%). A mean age of the first-episode epilepsy was 30.9±1years. Duration of treatment was8.6±0.5 years in average.The patients had been treated in the EC in average of 2.6±1.1years.Almost half (45.1%) of the patients was investigated by computed tomography (CT) scan and 51.1% found with the lesion. Magnetic resonance imaging (MRI) was performed in 43.9 % and 56.1 % found with abnormality. Of 55.8% of the patients undergone for electroencephalogram (EEG), 79.8% were detected with positive result. The top three types of epilepsy presented in the EC were generalized tonic clonic seizure (59.4%), complex partial seizure (41.4%) and simple partial seizure (10.5%). Most of the patients (44.1%) received monotherapy while 32% was treated with 2 antiepileptic drugs (AED). The most two common AEDs used were phenytoin (44.0%), and sodium valproate (40.4%). Therapeutic drug monitoring was carried out in 7.8% of the patients. The mean of seizure frequency was7.46±0.69times in a month.Approximately 56% of the patients had seizure free.

Conclusion: Data on patient characteristics and outcome were obtained in this study. Detail analysis is important for better understanding of factors-related to seizure control.

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Characteristics of epilepsy patients in outpatient clinic, Neurology Department, Cipto Mangunkusumo Hospital, Jakarta

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Purpose: Epilepsy is defined as a spectrum of neurological disorder characterized by an abnormally increased tendency to develop seizures with history of at least one previous seizure, persistent alteration of the brain, and associated neurobiologic, cognitive, psychological, and social disturbances. The aim of this study is to describe characteristic of epilepsy patient at outpatient clinic, Neurology Department, Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Method: A descriptive cross sectional study was conducted during first semester of 2012.

Results: There were 103 patients with epilepsy during January-March 2012. Mean of age was 35.2+ 13.8 (16-76). Age of onset was 20.01+14.3 years old and age of starting medication

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was 21.1+14 years old. Most of the patients were educated, only 12.6% that was uneducated. However, there were still 35% patient that unemployed. There was only 11.7% had delayed development during childhood. About 42.7% had remote factors to epilepsy (i.e head trauma, CNS infection, stroke, etc). History of febrile seizure was found in 37.9%, meanwhile behavior disorder was found in 29.1%. Most of patients were having partial (focal) seizures (64.15) and only 15.5% seizure free in the last 1 year. All of the patients with focal seizures had aura with the most frequent one is epigastric aura.
Conclusion: Even though the stigma of epilepsy is embedded among population, epilepsy patients can have education and employment. Most of the patient cannot be seizure free. The government hospital and government insurance don't cover the new AED that is necessary to some patients. Therefore, the number of patient that has seizure free still less than 20%.

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Transference pattern of epilepsy patients to the epilepsy center
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Purpose: We investigated the transference patterns of epileptic patients in NHIMC Ilsan Hospital Clinic and their related social variables, in order to formulate the optimal role of tertiary epilepsy program.
Method: : From July 2010 to July 2013, 271 patients were serially registered to NHIMC Ilsan Hospital Epilepsy Clinic for the first time in their lives. The contents of epilepsy registry were reviewed and analyzed.
Results: 1) Referral Route: self referral through mass media was 39.2% and physician referral was 60.8%(primary physician 32.7%, psychiatrist 13.4%, neurologist 10.6%, rose club 4.1%) 2) Majority of the patients(88.2%) was seeking for the better management of longstanding epilepsy, whereas 11.8% was for initial diagnostic issue. 3) Duration of illness before the referral was less than 1 year 8.2%, 1 to 5 years 28.7%, 5 to 10 years 20.4%, 10 to 20 years 30.2%, over 20 years 12.5% 4) Age at the registration was below 10 7.7%, 10 to 20 26.6%, 20 to 30 38%, 30 to 40 19.7% over 40 8.2% 5) Tentative variables such as seizure type, frequency, education, rural vs urban living and job occupancy were not correlated with referral patterns.
Conclusion: At the present time, a tertiary epilepsy center confronts a variety of heterogenous patient population, with wide clinical spectrums, which renders the formulation of specific task very difficult.

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Validation of ICD-10AM emergency and inpatient hospital coding
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Purpose: Data-linkage is an emerging powerful tool enabling medical diseases and health outcomes to be connected using routinely collected centralised databases. However, validity of seizure and epilepsy diagnosis limits precision of any estimates. This study assesses the diagnostic validity of emergency department (ED) and inpatient ICD-10AM coding at an epilepsy tertiary referral centre.
Method: Cases were defined as patients coded with ICD Codes (G40, G41, R56.8, F80.3), and non-cases as the most common alternative ICD coded diagnoses e.g. R55 (syncope and collapse), F44 (conversion disorders) etc. We sampled equally from 300 consecutive cases and randomly sampled 300 non-cases from 3/7/2012 to 10/7/2013. An epilepsy specialist and epilepsy fellow

independently confirmed the diagnosis. Agreement between raters confirmed the final diagnosis. Disagreements were reviewed by a third epilepsy specialist before final consensus reached. Other features of the history, treatment and investigations were also collected.
Results: 72/150 ED and 85/150 inpatient cases were confirmed to have epilepsy, and 150/150 ED and 150/150 inpatient controls were confirmed to be non-epilepsy. There was no difference in the correct classification of cases from ED and inpatient charts ($p< 0.23$). An EEG and CT brain were ordered more frequently in those without epilepsy ($p< 0.001$) whilst AED levels were ordered more frequently in those with epilepsy ($p< 0.001$). The PPV, NPV, and AUC were calculated for G40+G41+R568 (52.3%, 100% and 0.84) and G40+G41 (71.1%, 88.7%, 0.79). This improved to 82%, 89.7% and 0.93 when the number of AEDs was included in the G40+G41 model, however the effect of EEG, CT brain and previous admissions on cases were modest.
Conclusion: Diagnostic coding precision of epilepsy and status epilepticus in a tertiary referral centre was similar to other high-income countries. The addition of the number of AEDs improves the precision of case identification for epilepsy data-linkage design.

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Domestic health visitor to improve access to care for people living with epilepsy in Lao PDR
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Purpose: This study aims to test the effectiveness of a primary health care (PHC) approach, namely the Health care visiting (HCV), performed by health centre staff, to improve access to treatment and care of people with epilepsy (PWE).
Method: This clinical trial will be conducted during two years in three rural districts bordering of Vientiane Capital: one intervention district (Pakgnum with 411 PWEs according to estimation 2012 by prevalence 7.7 per 1000) and two districts control without intervention (Naxaythong with 533 PWEs and Sangthong with 221 PWEs according to estimation 2012 by prevalence 7.7 per 1000). The intervention is HCV who will identify suspected cases in villages and will raise awareness on epilepsy using specific Information Education Communication tools. The neurologist will confirm the diagnosis and the treatment will be delivered by HCV at home every two months. The identification and follow-up of PWE will be supported by neurologist consultation. We use three technological resources for coordinating this research: DBMS (database management system), GIS (Geographical Information System) and different statistical software for analysis.
Results: Our expected results are to reduce by 25% the treatment gap, to increase 70% uptake and adherence of PWE to their treatment, to increase 60% of knowledge attitudes and practices of PWE and their families related to epilepsy and the treatment, to reduce 60% the stigma regarding epilepsy in the PWE, their families and community, to increase 80% in the knowledge, skills, competence and sense of confidence and independence among the PHC staff. Moreover, we expect to increase by 50% economic condition of PWE and their families.
Conclusion: The health care needs to be address to community. So our objective is to find best strategy with cost- effectiveness adapted to developing countries.
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Incidence of pediatric epilepsy in Hasan Sadikin Hospital Bandung, Indonesia

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Purpose: To know the incidence of epilepsy in pediatric in Hasan Sadikin Hospital Bandung.
Method: This research using retrospective methods by searching all medical record of childhood epilepsy who came to pediatric epilepsy clinic in Hasan Sadikin Hospital for the last three years. Age, sex, onset of first unprovoked seizure, EEG (Electroencephalogram), treatment, compliance and other co-morbid will be noted
Results: From 2010 until 2013, we found 245 children who suffered from epilepsy. Most of them are male (55,1%). Their age are very varies, the youngest age is 1 month and the oldest is 15 years old. Based on ILAE classification, generalized tonic-clonic is the most common type of seizure (55,9%) beside other type such as focal seizure, absence, mioclonic or atonic seizure. In EEG, we found focal epileptiform are more common. For treatment, valproic acid given more frequent than topiramat or carbamazepine and proved effective. Only few patients have a poor compliance. Seizure in some patients hasn't controlled yet, even in some patients had intractable epilepsy. Co-morbid in some patients also influence the intractable epilepsy
Conclusion: Epilepsy often occur in pediatric population in Hasan Sadikin Hospital Bandung-Indonesia.

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Characteristics of epilepsy at 5 main islands in Indonesia

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Purpose: To describe the characteristics of epilepsy patients at 18 hospitals of 5 main islands in Indonesia.
Method: It was descriptive study at 18 hospitals of 5 main islands (Sumatra, Bali, Java, Sulawesi, Flores) lasted for 6 months at 2013.
Results: There were 2288 patients recruited; 487 (21.3%) were newly diagnosed epilepsy. Median age was 25 (1-85) years old, mean age was 28.33+16.67 years old, which is productive age. Mean age of seizure onset was 20.25+15.81 years old. There were 25.6% unemployed. Regarding of education, 32.8% had passed senior high school; however, 16.5% uneducated. The most 4 frequent underlying diseases that are presumed as the etiology factors of epilepsy are head trauma (44.2%), CNS infection (13%), stroke (11.7%), brain tumor (9.6%). History of febrile seizure was found in 29% patients. There were 83.17% had partial seizure with aura which the most frequent is epigastric rising sensation and autonomic signs (60.1%).
Conclusion: Most epilepsy patients are in productive age. The most 4 frequent etiologies are head trauma, CNS infection, stroke, brain tumor. The most frequent seizure type is partial seizure and mostly with epigastric rising sensation and autonomic signs aura.

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Genetics

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Interactive association of synaptic vesicle trafficking genes with idiopathic epilepsies in North Indian population

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Purpose: The maximal patient pool arriving at the hospitals is the "common epilepsies" which are the most frequent, non-familial cases of possibly sporadic nature, with their genetics largely unexplored. As the long existing concept of channelopathies with its origin from Mendelian epilepsies may not hold true for them, hence demands the revision and shift of focus to other pathways such as synaptic vesicle trafficking, as used for the current work. Also, despite substantial research on channels, the unexplained molecular basis behind various epilepsy pathogenesis, neuronal circuits for seizure generation and seizure controls further warrants the need of current approach.
Methods: A total of 478 patients of north Indian ethnicity comprising of generalized (325) and focal (143) seizures were enrolled. This also included idiopathic (164) and symptomatic (146) epilepsy patients. 170 healthy individuals were also enrolled. A set of 53 SNPs from six genes from synaptic vesicle trafficking were genotyped and association testing was performed between cases and controls followed by subgroup analysis in seizures and epilepsy types with controls each. Further, interactive analysis was performed by multifactor-dimensionality-reduction (MDR) for an overall best model prediction.
Results: Nominal associations in single locus analysis were found for rs28526693 of STX1A and rs363014, rs6039769 of SNAP25 in idiopathic patients with p-value< 0.05, when compared with healthy individuals. Later, MDR analysis revealed an interaction between rs4363087_STX1A (intron 6) and rs2278637_VAMP2 (3'near gene) with a cross-validation consistency of 10/10, maximal testing accuracy=0.6407, Sensitivity=0.6353 and Specificity=0.6463 with p-value < 0.0001,OR=3.183, 95%CI=2.03-4.98. The two SNPs have also shown functional significance as predicted by HaploReg V2.
Conclusion: Significant synergistic interaction was found between two genes of synaptic vesicle trafficking thus revealing the existence of significant functional relatedness. Synaptic vesicle trafficking has thus come up as a novel alternative mechanism for understanding of pathogenesis behind Idiopathic epilepsy.

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HLA-DRB1*1501: a risk factor for Stevens-Johnson syndrome and toxic epidermal necrolysis induced by aromatic antiepileptic drugs in Chinese Han population?

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Purpose: Previous studies suggested that one or more HLA alleles participate in the pathogenesis of AEDs induced SJS/TEN, but most of them only focused on HLA-B alleles. The aim of this study was to investigate the pathogenesis of AEDs induced SJS/TEN across a wider spectrum of HLA alleles, which involves HLA-A, B, DRB1 alleles, to further explore the association between HLA alleles and SJS/TEN induced by aromatic AEDs.
Method: A total of 27 patients with AEDs induced SJS/TEN (16 CBZ-SJS/TEN, 7 LTG-SJS/TEN,

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2 PHT-SJS/TEN and 2 PB-SJS/TEN) and 64 patients who were tolerant to AEDs were recruited. High-resolution HLA genotyping was performed to estimate the HLA-A, B, DRB1 alleles for each subjects.

Results: Fifteen subjects carried HLA-B*1502 alleles in the SJS/TEN group while only 4/64 in the tolerant group, the frequency of HLA-B*1502 is significantly different (P = 0.000). Nine patients carried HLA-DRB1*1501 allele in the SJS/TEN group while 12/64 in the tolerant group, when considering two patients in the SJS/TNE group were homozygous for this allele, the prevalence of HLA-DRB1*1501 between the two groups is at statistical significant difference (P = 0.041). Furthermore, the carrier rate of HLA-A*3303, HLA-B*5801 and HLA- DRB1*0301 were obviously lower in the SJS/TEN group than the tolerant group. The frequency of these alleles between the two groups reaches statistical significance (P = 0.009, 0.016 and 0.009, respectively).

Conclusion: The HLA-DRB1*1501 allele may be a risk factor for AED-induced SJS/TEN in Han Chinese. The HLA-A*3303, HLA-B*5801 and HLA-DRB1*0301 alleles were significant "protectors" against AED-induced SJS/TEN, especially CBZ-SJS/TEN. We highlight the need of studies in larger samples to further confirm our hypothesis and explore the function of HLA genes in the pathogenesis of AED-induced SJS/TEN among different ethnic groups.

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Very early onset Krabbe disease: A report of three cases

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Krabbe disease or globoid cell leukodystrophy is an autosomal recessive lysosomal disorder involving the white matter of the peripheral and central nervous systems. It is caused by a deficiency of galactocerebrosidase enzyme activity. The most common manifestation is the classical early onset Krabbe disease, but it may also present later in infancy, in childhood, or even adulthood. In this study, 3 Turkish patients with very early onset Krabbe disease were reported.

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Association between distributions of component genotype of three sites of SCNIB gene and epilepsy

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Purpose: To study the single nucleotide polymorphisms(SNP)in 3 sites allele (T189M, R85H, C121W) of SCNIB and the association between gene distribution and epilepsy.

Methods: All 330 blood samples of refractory (80 cases), non-refractory(100 cases)epilepsy patients and healthy people (150 eases) were collected. Genomic DNA of leucocyte was extracted. SNPs of three sites allele of SCNI B were tested by allele-specific primer-polymerase chain reaction (ASP-PCR). Data were analyzed by SAS 8.1 statistical software.

Results: Epilepsy group and healthy group had significantly statistical difference in composition of 3 sites allele on single site genotype(x2=l1.19,11.14 and 6.50,all P< 0.05). There was no statistical significance between refractory and non-refractory epilepsy group.On gene combination, in 27 different combinations of polymorphism,mutation frequency in 3 sites(CT+AG+CG) was highest in epilepsy group(18.40%). The next was one site in CT+G-

G+CC(16.80%). In healthy group,frequency of non-variant in CC+GG+CC was highest(16.67%),and the next was 2 sites in CT+AG+CC (13.73%). Thirty-five cases in epilepsy group (28.80%) had 3 sites mutation compared with 10 cases in healthy group (9.71%), and their difference had statistical significance (X2=12.54,P< 0.05). Eighteen cases in refractory epilepsy group (30.51% had 3 sites mutation compared with 21 cases in nonrefractory epilepsy group (28.77%), and the difference had no statistical significance.Fifty cases in epilepsy group (40.00%) had 2 sites mutation compared with 41 cases in healthy group (40.20%), and there was no statistical significance between them; 25 cases in refractory epilepsy group (42.37%) had 2 sites mutation compared with 21 cases in non-refractory epilepsy group (28.71%), and their difference had no statistical significance.

Conclusions: Mutation,especially multisite mutation of SCNI B is relatively likely to cause epilepsy in human. Gene distribution and combination of three sites allele of SCNIB inrefractory epilepsy is close to that in non-refractory epilepsy.

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Distribution of GST-pi single nucleotide polymorphism in idiopathic epilepsy patients

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Purpose: To study the distribution patterns of the SNPs for the 3 sites (II e105Val, Ala114Val and Asp147Tyr) of glutathione S-transferase pi (GST-pi) in epilepsy patients without definite etiological factors.

Methods: At the same time, the possible relationship of GST-pi gene mutation with the vulnerability of drug-resistant epilepsy, drug-responsive epilepsy and EEG feature were explored. The SNPs of GST-pi for healthy people, drug-responsive epilepsy patients and drug-resistant epilepsy patients were genotyped by sequence-specific primers (SSP)-based PCR technologies (PCR-SSP).

Results: In drug responsive epilepsy group, the frequency for 3 sites of mutated SNP of GST-pi was 59.62%, 55.32% and 50.94%, while it was 58.33%, 51.19% and 45.92% in drug-resistant epilepsy group. The difference of genotype and allele between normal group and foregoing epilepsy group was significant (P< 0.01), but no difference was found between drug-responsive epilepsy group and drug-resistant epilepsy group (P>0.05).

Conclusions: The results indicate that the SNPs of GST-pi are associated with an increased risk of epilepsy, but not associated with an increased risk of drug resistant epilepsy.

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Quantitative functional analysis of splicing mutations in SCN1A cause epilepsies with febrile seizures: mechanisms and correlations with clinical severity

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Purpose: The sodium channel α1 subunit (SCN1A) gene is associated with febrile seizures (FS)-related epilepsies. In contrast to truncation or missense mutations in which the resulting protein abnormalities are known, the consequences of splice-site mutations in SCN1A, especially relationship between the clinical phenotype and the splicing level and location, are not studied.

Method: Mutations in SCN1A were screened by PCR amplification and denaturing high performance liquid chromatography analysis and direct sequencing in patients with epilepsy and

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FS. In vitro minigene splicing assay was applied to investigate the consequences of mutations at or adjacent to splice-sites of SCN1A. Real-time fluorescence quantitative polymerase chain reaction was used to measure the mRNA levels of SCN1A mutation that alter splicing.
Results: Six splice-site mutations were detected in our cohort of patients. Six splice-sites mutations previously reported were covered in the research. Five mutations in invariant splice junction (-1, -2, +1 and +2) caused complete involved exon skipping or partial exon skipping and the aberrant intronic insertion. The level of aberrant transcripts is much higher than the normal transcripts. The associated phenotypes was severe form of the epilepsy including Dravet syndrome (DS) and Lennox-Gastaut syndrome. In contrast, two deep intronic mutations (c.473+110A>G in 2 patients; c.4853-25T>A) only caused partial intronic sequence inserted, and generated aberrant transcripts as well as normal transcripts, the level of normal transcripts is higher than the aberrant transcripts. The phenotypes associated with these two mutations were moderate form of the epilepsy including generalized epilepsy with febrile seizures plus, febrile seizures plus and partial epilepsy with febrile seizures.
Conclusion: This is the first report showing the consequences of SCN1A splice-site mutations in epilepsy patients. The severity of epilepsy is correlated with the aberrant splicing level and splicing pattern of mutations, which depends on location of mutations.

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Partial epilepsy with antecedent febrile seizures associated with SCN1A mutation and seizure aggravation induced by sodium channel blocking AEDs

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Purpose: Partial epilepsy with antecedent febrile seizures (FS) is previously reported to potentially associate with SCN1A mutations. Considering history of FS is common in partial epilepsy, we further screened SCN1A mutations in a large cohort of patients with partial epilepsy with antecedent FS, including those with or without family history of FS or epilepsy.
Method: Mutations in SCN1A were screened in 236 patients (or probands) with partial epilepsy with antecedent FS using denaturing high-performance liquid chromatography and sequencing. The level of mosaic mutation was quantified by pyrosequencing. Clinical data of SCN1A positive-mutation patients were collected, and all the SCN1A mutations reported previously in partial epilepsy were reviewed.
Results: A total of 27 SCN1A point mutations were indentified in 27 patients. There were 18 (66.7%, 18/27) missense mutations, in which 10 (55.6%, 10/18) located in pore/voltage sensor regions, and 8 (29.6%, 8/27) truncating mutations including nonsense and frameshift in 2 each, and splice site mutations in 4. Inherited mutations occurred in 8 (33.3%, 8/24) cases, in which 3 are inherited from mosaic parents. The SCN1A positive-mutation patients exhibited moderate clinical characteristics regarding to age at onset of first seizures, seizure frequency and developmental outcomes, especially seizure aggravations induced by sodium channel-blocking (SCB) AEDs. Accordingly, missense mutations in pore/voltage sensor regions were associated with less amino acid residue changes in Nav1.1. All truncating mutations distributed in very early sequence of SCN1A or far away from natural stop codon. Seven out of 8 SCN1A mutations associated with seizure aggravation induced by SCB were truncating mutations and missense mutations in pore regions.
Conclusion: Existence of SCN1A mutations should be considered when patients with partial epilepsy had history of FS, including those with or without family history of seizures. Seizures aggravation induced by SCB associated with SCN1A mutations is potentially the sources in intractable epilepsy.

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Transcriptional upregulation of non-LTR retroelements with age and in response to stresses

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Purpose: Basic objectives were to analyze the transcriptional regulation of L1Rn elements in response to stresses.

Method: Real time PCR analysis using RNA isolated from various brain regions and various tissues from old and young wistar rats was carried out to determine the change in L1 transcripts.

Results: There was no significant change in the expression of L1Rn in various brain regions of 2 month old and 18 month old rats except cerebral cortex.

The heavy metals nickel, cadmium, lead, mercury and aluminum upregulates the expression of L1 in tissue specific and age dependent manner.

Conclusion: The results of this investigation conclusively prove that LINE1 retroelements are transcriptionally activated in response to stress.

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Focal seizures associated with protein S deficiency and multiple white matter ischemic lesions

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Purpose: Cerebrovascular disease is one of the most important causes of epilepsy. Approximately 1% of Japanese population are reported to have protein S deficiency, and at high risk for congenital coagulation disorders. Here we investigated clinical characteristics of focal seizures associated with protein S deficiency and white matter ischemic lesions.

Method: A nineteen-year-old right-handed female started having episodes of sudden nausea, white out of the whole visual field, loss of consciousness, and fell down with convulsion of all extremities at the age of 18. More recently she had daily convulsion of one or more extremities for several minutes with preserved consciousness. She had no history of central nervous system infection, head trauma, delivery complications, or developmental abnormalities. We performed blood tests, long-term video EEG monitoring, and imaging studies.

Results: She had no abnormality in physical and neurological examinations. Recorded seizures comprised of abrupt visual symptoms followed by convulsion of extremities. Interictal EEG showed intermittent rhythmic slow waves and repetitive epileptiform discharges at bilateral parietal and occipital areas, which became more frequent during ictal state. Brain MRI showed multiple spotty T2 and FLAIR high intensity lesions in deep white matter and subcortical areas disproportionate to her age. In blood test quantity of protein S was 53% (normal range: 65%-135%). We diagnosed that the patient had focal seizures associated with protein S deficiency.

Conclusion: It has been reported that coagulation disorder like protein S deficiency is an independent risk factor of white matter ischemic lesion, and pathologically MRI-invisible small microinfarction can exist when brain MRI images exhibit multiple microinfarction. Our patient showed a possible association between cerebral ischemic lesions due to protein S deficiency and development of focal epileptogenicity.

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HLA-B*1502 allele association with Carbamazepine-induced severe cutaneous reaction in Malaysian Indian, a pooled-sample analysis and meta-analysis

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Purpose: Carbamazepine (CBZ), a first line anti-epileptic drug (AED), is one of the main causal drugs for Steven-Johnson Syndrome (SJS) and Toxic epidermal Necrolysis (TEN). Studies among Southeast Asia populations identified a strong association between carbamazepine (CBZ)-induced SJS/TEN and HLA-B*1502 allele. Currently, there was only one paper published on HLA-B allele association with Carbamazepine-induced Stevens-Johnson syndrome (CBZ-SJS/TEN) in Indians. This study aimed to investigate the strenght of HLA-B*1502 allele association with Carbamazepine-induced Stevens-Johnson syndrome (CBZ-SJS/TEN) in Malaysian Indian, with a meta-analysis.

Method: 5 subjects with CBZ-SJS/TEN and 52 CBZ-tolerant controls were recruited from University Malaya Medical Center, Malaysia, and a pooled sample analysis of 7 subjects from three centers in Malaysia was performed. The presence of other common HLA-B alleles were compared to tolerant controls. Meta-analysis was performed with previous studies from India on association of HLA-B*1502 in CBZ-SJS/TEN.

Results: HLA-B*1502 allele was present in 40% of Indian patients with CBZ-SJS/TEN in our cohort. Pooled-data analysis of 7 cases with 52 CBZ-tolerant control showed 57.1%, Indian cases with CBZ-SJS/TEN tested positive for HLA-B*1502. There was significant association between HLA-B*1502 and CBZ-SJS/TEN in Indian when comparing case with tolerant controls (40% versus 3.8%; p = 1.05 x 10-3 ; Odds ratio (OR) 19.9; 95% confidence interval (CI) 4.25 - 261.21). Meta-analysis of association between HLA-B*1502 and Indian with CBZ-SJS/TEN showed strong association (p < 1.0 x10-4 ¬; OR 38.54; 95% CI 6.83 - 217.34). Combining the data, the test has a sensitivity and specificity of 66.7% and 96.8% respectively, with high PPV (83.3%) and NPV (92.3%), despite a low background carrier rate (3.8%).

Conclusion: The association of CBZ-SJS/TEN with HLA-B*1502 is significant in Indians and meta-analysis showed that HLA-B*1502 is a significant predictor of CBZ-SJS/TEN.

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Association between HLA-B*1502 allele and Carbamazepine-induced Stevens-Johnson syndrome and toxic epidermal necrolysis in adult focal epilepsy patients from Hasan Sadikin Hospital, Bandung

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Purpose : Carbamazepine (CBZ) is an anti epilepsy drug (AED) which is important for focaly partial epilepsy. Although CBZ is also considered as one of the most common causes of antiepileptic drug-induced Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN). Strong association has been reported between human leucocyte antigen (HLA)-B*1502 and CBZ-induced SJS and TEN in several Asian countries. The aim of this study was to investigate the association between HLA-B*1502 allele and CBZ-induced SJS/TEN among adult focal epilepsy patients from Hasan Sadikin Hospital, Bandung.

Method: This is case-control study from 33 focal epilepsy patients. Eleven patients with CBZ-induced SJS/TEN and 22 CBZ-tolerant controls were recruited. Analysis for the presence of the

HLA-B*1502 allele was performed using a PG1502 DNA detection kit (PharmiGene, Inc., Taipei, Taiwan).
Results: HLA-B*1502 allele was present in 90,9% (10/11) of CBZ-SJS/TEN patients and 31,8% (7/22) of CBZ-tolerant patients. The risk of CBZ-induced SJS/TEN was significantly higher in the patients with HLA-B*1502 (odds ratio/OR 21,43 ; 95% confidence interval/CI 2,28-201,87; p-value = 0,001).
Conclusion: This study proved an association between HLA-B*1502 allele and CBZ-induced SJS/TEN in adult focal epilepsy patients from Hasan Sadikin Hospital, Bandung. This results might be used to help prevent CBZ-induced SJS/TEN by screening patients for HLA-B*1502 before CBZ treatment.

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Pilot association study of aromatic antiepileptic drugs induced cross-reactivity with HLA allele in Han Chinese
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Purpose: An association between carbamazepine-induced cutaneous adverse drug reactions (cADRs) and HLA-B*1502 or HLA-A*3101 has been reported in Han Chinese. We aimed to investigate whether HLA alleles could be as genetic markers for cADRs induced by at least two aromatic antiepileptic drugs (AEDs induced cross -reactivity)
Method: We performed a case-control study using high-resolution genotyping for HLA class I and HLA DRB1 loci. We set one case group including 12 patients with AEDs induced cross-reactivity and one tolerant control group recruiting 13 patients who took four aromatic AEDs including carbamazepine (CBZ), lamotrigine (LTG), oxcarbazepine (OXC) and phenytoin (PHT) without cADRs. We also set one normal control group including 527 healthy volunteers.
Results: In the case group, there were two (2/12) patients positive for HLA-B*1502 and only one patient (1/12) positive for HLA-A*3101. The presence of HLA-B*1502 and HLA-A*3101 were not significantly different between the case group and either of two control groups ($P > 0.05$). Furthermore, other HLA alleles showed no significant association with aromatic AEDs induced cross-reactivity.
Conclusion: Our data suggested that neither HLA A*3101 nor HLA A*1502 was an effective predictive marker for aromatic AEDs induced cross-reactivity. It warrants a multi-center study with a larger sample to explore genetic markers besides HLA alleles for cross-reactivity caused by aromatic AEDs.

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SCN1A mutations and clinical phenotype in Singapore
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Purpose: *SCN1A* mutations are associated with a wide range of clinical phenotypes from generalized epilepsy with febrile seizures plus (GEFS+) to intractable childhood epilepsy with generalized tonic-clonic seizures (ICEGTCS) and Dravet syndrome. We describe the SCN1A mutations identified from our institution and associated clinical phenotypes.

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Method: Five children with epilepsy were tested at our institution. Clinical phenotype and demographics were abstract from clinical notes. Molecular analysis for SCN1A was carried out on genomic DNA extracted from venous blood (GTC Australia, Athena diagnostic, USA).
Results: Five children aged 2 years 6 months to 6 years 5 months (4 female, 1 male) were tested. Median age at seizure onset was 4.8 months (range 3·6 months): febrile status epilepticus in three (2 post DTP), focal seizure in one and infantile spasms in one. Phenotypes were Dravet syndrome (3), infantile focal epilepsy (1) and West Syndrome (1). All had normal prior development. Initial EEG showed hypsarrhythmia in one, slow background activity with frontal spikes in one and was normal in 3. All had normal MRI brain. At follow-up, 4 had mild to moderate intellectual delay.
Molecular analysis for SCN1A demonstrated mutations in: c.4852+1G>A (mutation:known pathogenic, phenotype:Dravet Syndrome) c.1013A>G (equivocal, Dravet), c3862G>A genetic variant (equivocal, Dravet borderline) , c1410C>T (equivocal, West syndrome), and SCN1A: c.1811G>A (equivocal, infantile focal epilepsy). Of four mutations with equivocal significance, three were associated with clinically significant phenotypes. One was associated with clinically significant phenotype but was also present in the mother.
Conclusion: We describe five patients with SCN1A mutations, one known to be pathogenic and four of equivocal significance. Three of these may be pathogenic mutations: c3862G>A, c.1013A>G and c.1811G>A. Further analysis would elucidate a pathogenic role.

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Epilepsy in RETT syndrome: related to MeCP2 genotype mutations and phenotype observations associated with chromosomal alterations in Coimbatore

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Rett syndrome (RS) is a neurodevelopment disorder seen almost exclusively in females, and usually associated with MeCP2 gene at Xq28.1. Epilepsy occurs in between 70% (Cooper et al., 1988; Hagne et al., 1989) and 90% (Steffenburg et al., 2001) of individuals with RS. Epileptic seizures are commonly of multiple types, including complex partial, atypical absence and generalised tonic- clonic. This study focused to analyze the frequency of epileptic seizures and non-epilepsy in RS, and any involvement of these features with the type of MeCP2 genotypic analysis. RS and Seizure diagnosis and clinical profiles were recorded based upon written and verbal reports responded to the questionnaire based on the DSM IV questionnaire by their parents/carers; were analyzed by epileptologists and pediatric neurologist. PCR amplification of MeCP2 gene coding exons was performed using primers and automated sequencing was done on the DNA sequencer. The Karyotype results of 16 subjects were carried out by GTG banding and their results were confirmed by FISH. The study was approved by the Institutional ethics board. Myoclonic jerks and status of epilepsy are sometimes difficult to distinguish clinically from movement disorders such as the stereotypic hand moves and dystonia of RS. Higher degree of chromosomal alterations observed in X- chromosome includes 46,XX,t(X;22) (p11.22; p11), 46,XX,del(13)(13q12.1-q21.2). MeCP2 mutations were observed in 9 of 16 (56.25%) cases. Among these, 8 sporadic and 1 familial was observed. We have found a prevalence of epilepsy of (n=7; 44%) among RS patients and prevalence (n=3; 33%) varied the type of MECP2 mutation within this population. we believe it is one of very few studies to attempt to identify an association between the MECP2 mutation and the features of its epilepsy. Our results support the previously described role of MeCP2 mutations and will require detailed and larger analysis.

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Evaluation genotype variants related with homocysteine levels in chronic epileptic patients treated with antiepileptic drugs in Coimbatore populations

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Introduction: Epilepsy is most common paroxysmal and heterogeneous neurological disorder affecting an estimated 42 million people worldwide with distinct symptoms, etiology, prognosis and treatments. There is emerging evidence to support the unfavorable effects of some AEDs on the plasma Hcy concentrations. Elevated Hcy levels may be induced by AEDs administration, but also the risk of resistance to anti-epileptics and development of refractory epilepsy. The present investigation has been carried out to explore the possibility that neurological problems in patients with chronic epilepsy treated AEDs are associated with the effect on Hcy metabolism.

Methods: Total of 14 of epileptic patients who were treated with AEDs at least for 9 months and sex/age matched controls were enrolled for this study. The crucial aim of present study to analyze the frequency of occurrence of genotype polymorphisms of MTHFR (C677T) and MTRR (A66G) gene by PCR-RFLP and to analyze concentrations of total Hcy in the serum was measured in a fasted status. Demographic and medicine information was collected via a questionnaire.

Results: Hcy levels showed higher when compared to controls. The frequencies of the MTHFR and MTRR genotype homozygous or heterozygous variant among the patients respectively [(n-17;80.95%); (n-18;85.71%) and wild type genotype observed in MTHFR and MTRR genes respectively (n-4;20.42%); (n-3;4.28%).

Conclusion: The present study confirms the association between hyperhomocysteinemia and epilepsy treated with AEDs. Although the real origin of this phenomenon is not yet fully illuminated, An increased number of patients and analysis of additional variables would undoubtedly confer to the study a stronger scientific value, particularly duration of the disease and exposition to AEDs, frequency of seizures, type and location of EEG abnormalities, and volumetric determinations of particular brain areas, especially amygdale and hippocampus. This approach may be more relevant possible relation with neural tube defect.

Keywords: Antiepileptic drugs, genotype variants, Homocysteine.

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A clinical genetic study of ethnic variations between Malaysian Malays, Chinese and Indians with idiopathic generalized epilepsy

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Purpose: To study the characteristics of epilepsy patients with idiopathic generalized epilepsy (IGE), positive family history of epilepsy and febrile seizures in Malaysia.

Method: In this retrospective study, 229 patients with clinical diagnosis of IGE were recruited in the neurology outpatient clinic, University of Malaya Medical Centre (UMMC), from 2011 till Jan 2014.

Results: In our epilepsy cohort (n=1,675), 229 (13.7%) patients were diagnosed with IGE. 100 (44.4%) of IGE patients were Malaysian Indians. 20.7% of Malaysian Indians from our epilepsy cohort has IGE, significantly higher than 15.9% in Malays and 8.6% in Chinese epilepsy patients ($p< 0.001$). 57 (24.9%) of all IGE patients have family history of epilepsy, of which 28.0% of the Indian patients with IGE had positive family history, more than the Malay (24.2%) and Chinese (20.6%) ethnic group. Age of seizure onset was found to be significantly different between Malaysian Indian (16.1 years) and Malaysian Chinese (11.9 years) ethnic groups ($p< 0.01$).

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Malaysian Indians also have significantly fewer cases with history of febrile seizures (3.6%) compared to the Malays (40.0%) and Chinese (30.8%) ($p < 0.05$). Lifetime prevalence of epilepsy among siblings were however highest among the Malays (25.8%), followed by Malaysian Chinese (19.8%) and lowest among Malaysian Indians (9.2%). Consanguineous marriage was noted in 4 (14.8%) Indian families with IGE and positive family history.
Conclusion: IGE with positive family history is prevalent in Malaysia. Malaysian Indians have the highest percentage of IGE as well as IGE with family history of epilepsy among the three major ethnicities in Malaysia, suggesting that there is an ethnic variation in genetic risk in IGE.

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A case of tuberous sclerosis with subtle cardinal manifestations
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Purpose: Tuberous sclerosis complex (TSC) is known to show severe intractable epilepsy and mental retardation, however, diagnosis can be delayed in milder cases. Here we present a TSC patient with subtle cardinal manifestations.
Method: Reported is a 26-year-old right-handed female patient who started having convulsion at age 7 days. She had several seizures a year that were intractable to treatment with carbamazepine or phenytoin. Her two sisters had several episodes of suspected epileptic seizures. We performed thorough diagnostic evaluation and analyzed characteristics of the patient.
Results: Seizure semiology of the patient comprised of visual hallucination, convulsion predominantly on the right, and loss of consciousness. Physical examination revealed scattered several small angiofibromas over nose that are histologically determined by skin biopsy. Hypomelanotic macules, shagreen patches, or periungual fibromas were not seen. Neurological examination showed mental retardation (MMSE: 23/30, WAIS-III: VIQ63, PIQ59, FIQ58) and decreased vibration sensation in both legs. Interictal EEG showed slow waves and sharp transients regional bilateral frontal-parietal-frontotemporal areas dominant on the left. Brain imaging showed multiple cortical tubers and malformation of cortical development in left cerebral hemisphere but no subependymal nodules. Interictal IMP-SPECT showed hypoperfusion in bilateral frontal lobes and hyperperfusion in bilateral temporal lobes. Cardiac rhabdomyoma was not noticed by echography. Chest and abdominal CT showed sclerosis of bilateral lumbosacral joints. There was no abnormality of lung, major arteries, liver, or kidneys. No hamartomas or retinal achromic patches were noticed by ophthalmologic evaluation. Administration of lamotrigine was effective to her seizures.
Conclusion: This patient fulfilled with two major features of diagnostic criteria for TSC (Roach et al, 1998) and diagnosed as definite TSC. Patients with mental retardation and epilepsy, even those who lack of subependymal nodules or show only mild skin symptoms, should be carefully evaluated the possible diagnosis of TSC.

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Rett syndrome genotype - phenotype correlations
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Purpose: Rett syndrome is an X linked dominant neurological disorder that affects almost

exclusively girls with an estimated prevalence of 10,000---20,000.
Aim of the work: To highlight the clinical manifestations of Rett syndrome & to present genotype phenotype correlations
Materials & methods: The study included 15 girls (9 months- 5years) with typical Rett syndrome according to the international criteria .They were subjected to screening of the whole coding region of the MECP2gene (MECP2A& MECP2B) by DHPLC
Results: Microcephaly was present in 11 cases (73.3%), stereotypic hand movement in all cases (100%)in the form of washing movements (7 cases), clapping (2 cases), piano like movement (4 cases) and repetitive blows to the face in (2 cases). Head nodding was present in one case. Recurrent seizures were present in 8 case (53.3%). Delayed language development was detected in 7 cases (46.6%), deterioration of speech in 8 cases (53.3%), autistic features in 10 cases (66.6%), growth retardation and peripheral vasomotor changes in 7 cases (46.6%). Three mutations were detected in 10 cases (66.6%): heterozygous for p.R270X mutation (3 cases), heterozygous for p.R255X mutation (3 cases) and heterozygous p.R168X nonsense mutation (4 cases). Phenotype genotype correlation between the group of mutated gene and those with no mutation showed that microcephaly was present in (80% versus 60% respectively), seizures (70% versus 20%), growth retardation (50% versus 40%) and autistic features (70% versus 40%). But for those with no mutation, they were more frequently able to walk (60% versus 40% with mutation).
Conclusion: Mutations of MECP2 analysis were detected in 66.6% of Rett syndrome cases. Cases with detected mutation had more frequent seizures, microcephaly, growth retardation and autism. Concerning cases with no mutation, further investigations are required for X linked candidate genes.

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Mutational screening of SCN1A identified a 3´ UTR functional variant (c.*20A>G) associated with Dravet syndrome
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Purpose: Dravet Syndrome (DS) is an age-dependent epileptic encephalopathy onset in the first year of life and is one of the intractable epilepsies. Mutations in the voltage-gated sodium channel α subunit type1 (Nav1.1) gene (SCN1A) are frequently identified in patients with DS. Most of the mutational screenings have focused on the coding exons. A decreased level of Nav1.1 has been identified as the cause of DS. The 3´ untranslated region (UTR) could decrease level of Nav1.1 through affecting the gene expression in the post-transcriptional level. To investigate the association between SCN1A 3´ UTR and DS, we performed a mutational screening of SCN1A 3´ UTR on the DS patients and functional analysis of the detected mutation.
Methods: 28 DS patients without mutations in the SCN1A coding regions were screened for SCN1A 3´ UTR mutations by using PCR and direct sequencing. Functional analysis of the detected mutation via luciferase assays and RNA electrophoretic mobility shift assay (RNA-EMSA).
Results: We found a variant (c.*20A>G) in SCN1A 3´ UTR in one DS patient. The variant (c.*20A>G) increases the affinity of pluripotent embryonal carcinoma cell line NT2/D1 cytoplasmic protein binding and reduces the luciferase gene expression by 30% in NT2/D1 ($P < 0.01$).
Conclusion: SCN1A 3´ UTR Variant (c.*20A>G) may be associated with DS.

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Mutation in SLC1A1 for hot water epilepsy

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Purpose: To elucidate the molecular genetic basis of a sensory/reflex epilepsy triggered by the stimulus of contact with hot water.

Method: A three-generation family with several of its members affected with hot water epilepsy was studied using whole genome-based linkage mapping and exome-based sequencing. Functional cell biological correlates of the mutation were examined in assays measuring glutamate uptake by C6 glioma cells.

Results: A new locus for hot water epilepsy was identified at chromosome 9p24.3-p23 (lod score 3.66 for the marker D9S286 at θ=0). The critical genomic interval of about 10 Mb was defined by the markers D9S917 and D9S168. Sequence analysis of all known genes in critical interval identified 356 variants. Among these we found, one non-synonymous variant p.Val251Ile in the *SLC1A1* gene. p.Val251Ile is a rare variant and was found to segregate among affected members of the family. Val251 is a conserved residue across chimpanzee, dog, rabbit, mouse, rat, chicken and zebrafish. *SLC1A1* encodes a sodium-dependent neuronal glutamate transporter. As compared to wildtype SLC1A1, the p.Val251Ile carrying protein was found to affect glutamate uptake in a temperature-dependent manner: almost four-fold reduction in the uptake at 45 °C than at 25 °C.

Conclusion: Our study links hot water epilepsy phenotype to a molecular mechanism involving a member of the glutamate transporter protein family. Our ongoing studies are aimed at cell biological and electrophysiological characterization of the mutation, p.Val251Ile, and screening a cohort of hot water epilepsy patients for additional variant in *SLC1A1*.

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Gene identification in epilepsy, intellectual disability and psychiatric disorders using whole exome sequencing

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Purpose: Epilepsy is a genetically heterogeneous disorder. Although more than 30 epilepsy genes have so far been identified, the majority of cases remain unsolved. Prediction of biological pathways likely to be involved in the pathogenesis of epilepsy, beyond the well-established ion channel paradigm, remains difficult. Whole exome sequencing (WES) allows efficient detection of all genetic variants, increasing the potential for the identification of novel genes and pathways involved in epilepsy.

Method: Pedigrees of familial epilepsy cases were constructed and clinical information was obtained. Genomic DNA was prepared from individuals. Where families were of sufficient size, genetic linkage analysis was carried out to identify chromosomal regions harbouring the familial mutation. WES was employed to identify novel genetic variants towards determining the mutation of major effect. A larger cohort of patients was analysed to search for independent mutations and thus confirm the involvement of genes identified by WES.

Results: sing strategies combining linkage analysis with WES and WES alone we have identified novel genes involved in autosomal dominant forms of epilepsy. We have extended these gene findings beyond rare large families to show a broader contribution of the genes *KCNT1* and

DEPDC5 to epilepsy and its co-morbidities.
Conclusion: The application of WES has accelerated the rate of gene discovery in epilepsy, revealing new neurological pathways involved in the pathogenesis of this disorder. These new pathways may provide novel therapeutic targets for the treatment of epilepsy.

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Mutations in DEPDC5 are a major cause of lesional and non-lesional focal epilepsy
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Purpose: We set out to find the genetic cause of focal epilepsy in a family with individuals that had lesional and non-lesional focal epilepsy, as detected by MRI analysis. The focal epilepsy showed autosomal dominant inheritance and linkage analysis failed to identify any linkage region.
Method: We carried out exome sequencing on two individuals from the family who were affected with focal epilepsy and displayed abnormal MRI. The sequence data was analysed using an in-house bioinformatic pipeline. Candidate causative genetic variants were identified and validated by Sanger sequencing. These were analysed for co-segregation with affected status and assessed for their likely pathogenicity.
Results: We identified a mutation in *DEPDC5* as being causative of both lesional and non-lesional cases of focal epilepsy in the family. We also identified two other families with *DEPDC5* mutations who also had mutation-positive individuals with lesional and non-lesional focal epilepsy. *DEPDC5*-associated malformations included bottom-of-the-sulcus dysplasia (3 members from 2 families) and focal subcortical band heterotopia (1 individual).
Conclusion: We show that mutations in *DEPDC5* cause familial cases of focal epilepsy associated with structural lesions. Previously we found that mutations in *DEPDC5* caused familial cases of non-lesional focal epilepsy. We therefore now show that lesional and non-lesional epilepsy can have a shared genetic aetiology. This challenges previous dogma of lesional and non-lesional epilepsy being regarded as distinct entities. DEPDC5 negatively regulates the mTOR pathway which plays a key role in cell growth. The clinical and radiological phenotypes associated with *DEPDC5* mutations share features with the archetypal mTORopathy, tuberous sclerosis, raising the possibility of new therapeutic avenues for Focal Epilepsy patients.

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Association of UGT1A6 polymorphisms and non-genetic variant with valproic acid doses and plasma levels in Thai epileptic patients
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Purpose: The objective of this study was to investigate the association of *UGT1A6* polymorphisms together with non-genetic variant, drug interaction, with valproic acid (VPA) dose and plasma concentrations in Thai epileptic patients.
Method: One hundred and five Thai epileptic patients who were treated with VPA maintenance dose at Phramongkutkloa Hospital were recruited into this study. Taqman SNP genotyping assay was used to genotype *UGT1A6* 19T>G, 541A>G and 552A>C which were then classified as *UGT1A6*1* and *UGT1A6*2*. Three categories of co-medication, non-genetic factor, including drug inducer, drug inhibitor and drug with no effect were classified. Non-parametric statistics (Mann-Whitney U and Kruskal-Wallis test) were used to identify the association of genetic and non-genetic variants, drug interaction, with VPA maintenance dose and steady state trough plasma concentration.
Results: The results from this study demonstrated that patients who carry *UGT1A6*2* variant was associated with lower VPA dose (p-value = 0.005). Whereas, non-genetic factor, drug inducer had a significant association with higher VPA dose (p-value = 0.002). In line with this, drug inducer was found to be associated with lower VPA plasma concentration (p-value = 0.002) while *UGT1A6*2* were shown a tendency of association with higher VPA plasma level.
Conclusion: The present study demonstrated that genetic factor, *UGT1A6* polymorphisms, influenced variability in VPA dose while non-genetic factor, drug inducer, had an impact on both VPA dose and plasma concentration in Thai epileptic patients. These finding suggested that genetic variants in gene encoding drug metabolizing enzyme and non-genetic factor, drug inducer, could explain in part the inter-individual variability in VPA maintenance dose and plasma levels.

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Association of genetic variants in *CYP2C9, CYP2C19* and *ABCB1* genes along with non-genetic factors with phenobarbital blood levels in Thai patients with epilepsy

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Purpose: Phenobarbital is an inexpensive first-line antiepileptic drug used for treatment of partial and generalized epilepsy in developing countries. Some studies showed that the differential tolerability of phenobarbital is associated with genetic variability. This study aimed to investigate the association of genetic variants in *CYP2C9, CYP2C19* and *ABCB1* genes along with non-genetic factors with phenobarbital blood levels in Thai patients with epilepsy and to quantify the association by using multiple linear regression models.
Method: Twenty four Thai patients diagnosed with epilepsy and being treated with phenobarbital monotherapy were enrolled into this study. In addition to clinical data, blood samples were collected and measured for phenobarbital blood levels. Three candidate SNPs including *CYP2C9*3* c.1075 A>C, *CYP2C19*2* c.681 G>A and ATP binding cassette subfamily B *ABCB1* c.3435C>T were genotyped. Multiple linear regression analysis was used to identify the association between genetic variants and non-genetic factors with phenobarbital blood levels. All genotype frequencies were consistent with Hardy-Weinberg equilibrium (p>0.05)
Results: A multiple linear regression model revealed a significant association of phenobarbital blood levels with the presence of *CYP2C19*2, ABCB1* C3435T polymorphisms and type of seizure. The model explain 58.4% of the variability in phenobarbital blood levels normalized with dose (R2=0.584, p=0.025).
Conclusion: This study suggests that the genetic variants in *CYP2C19, ABCB1* and non-genetic factors including type of seizure influence variability in phenobarbital blood levels in Thai patients with epilepsy.

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Analysis of gene MDR1 among patients with drug-resistant epilepsy and healthy donor

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Purpose: Research of C3435T polymorphism of MDR1 gene and determination of its association with development of drug-resistance in epileptic patients against AED treatment.
Method: 59 DRE patients and 35 unrelated healthy people of Uzbek nationality were included in the research.
Results: The analysis of frequency of distribution of 3435 T/C polymorphism of MDR1 gene among DRE patients and apparently healthy donors has been made. It demonstrated that the gene alleles frequency distribution corresponded to the expected ones owing to Hard-Vainberg's law of balance. The indicators of relative deviation of expected heterozygosity from the one observed in the study groups of patients and the controls have made D =-0.11 and D = + 0.08, accordingly. Frequency of genotype variants of the polymorphism in the group of patients has made: CC - in 18.6 %, CT - in 55.9 %, and TT - in 25.4 % of cases. In the control group, it was: CC - in 60.0 %, CT - in 33.3 %, and TT - in 6.6 % of cases.
The obtained findings demonstrate a considerable effect of functionally weakened variants of C3435T polymorphism of MDR1 gene on efficiency of AED therapy. For instance, among patients poorly or not responding to the therapy, the frequency of functionally unfavorable T/T genotype was over 4 times reliably higher than in the control group.
Besides, due to a high level of specificity (SP=0.81) and to average sensitivity level (SE=0.6), the estimated indicator AUC (0.70) also proves rather high level of efficiency by the qualifier of the given marker as an independent gene-candidate for drug-resistance in epilepsy.
Conclusion: Presence of T-allele of C3435T polymorphism of MDR1 gene increases the risk of drug-resistance development in epileptic patients and is a reliable and predicting criterion of efficiency and validity of anti-epileptic therapies.

Neurobiology

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Increased susceptibility to the development of epilepsy in a mouse model of Alzheimer's disease

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Purpose: People with Alzheimer's disease (AD) are 10 times more likely to develop epilepsy compared with the age-matched general population. Epileptic seizures impose significant additional burden on medical care and disability in this vulnerable population. The mechanisms underlying the increased risk are unknown. We tested the hypothesis that the pathological changes of AD, notably accumulation of amyloid-beta, increase the susceptibility to the development of acquired epilepsy.
Method: We performed electrical amygdala kindling in aged (10-12 months old) Tg2576 transgenic mice and wild-type (WT) mice (n=8 per group). The Tg2576 mice are an established AD model that expresses the human amyloid precursor protein with the Swedish mutation (K670N/M671L) and displays progressive amyloid plaque deposition with cognitive and behavioural deficits of relevance to human AD. The sensitivity to the development of acquired

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epilepsy via kindling was compared between the Tg2576 and wild-type mice.
Results: Compared with wild-type mice, Tg2576 mice had significantly lower afterdischarge threshold (0.25 mA vs. 0.14 mA, p=0.04), required fewer stimulations to reach the first class five seizure (average number of stimulations 11.4 vs. 3.8, p=0.0072), had greater seizure severity, and longer seizure duration. Compared to the wild-type, higher death rates were also observed with the kindled Tg2576 mice (0/8 vs. 5/8).
Conclusion: Aged Tg2576 mice are more prone to the development of acquired epilepsy compared with the wild-type. These findings support the hypothesis that excessive amyloid-beta increases the susceptibility to acquired epileptogenesis.

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Brain levels of kynurenic acid, a glutamate receptor inhibitor, is altered in patients with drug-resistant epilepsy
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Purpose: Dysfunction of the excitatory synaptic transmission in human cerebral cortex constitutes a hallmark in epilepsy. Kynurenic acid (KYNA), a tryptophan metabolite that in the brain, is primarily synthesized and released by astrocytes, controls neuronal excitation by inhibition of glutamate receptors and α7 nicotinic acetylcholine receptors. Reduced tissue KYNA concentrations in various brain structures has been reported in animal models of epilepsy. Here we determine the alteration in concentration of KYNA in brain tissues resected during epilepsy surgery of patients with drug-resistant epilepsy (DRE), which might possibly constitute a common occurrence in the process of epileptogenesis.
Method: The resected brain samples were obtained from epilepsy patients as per the protocol approved by institutional ethics committee. The epileptogenic focus was removed during the standard surgical procedure, as confirmed by imaging and electrophysiological recordings. For control, non-epileptic brain tissues like that of tumour margin obtained during tumour surgeries were used. Resected samples were processed for measurement of KYNA levels using reverse phase high-performance-liquid-chromatography (HPLC) with fluorimetric detection (Swartz KJ et al. Analytical Biochemistry 1990;185:363-376). The data were presented as mean ± SEM and statistical significance was analysed using paired t-test.
Results: HPLC based measurement of KYNA in resected brain specimens revealed a reduction in the concentration of KYNA (nM/mg protein) in samples from patients with epilepsy (1.45 ± 0.29; n = 15) compared to that in case of non-epileptic controls (4.58 ± 1.69; n =8). This change in the concentration was statistically significant ($p < 0.05$).
Conclusion: The above-mentioned preliminary study suggest that altered kynurenic acid levels in the cerebral cortex of epilepsy patients could be a contributing factor to the process of epileptogenesis, especially in patients with DRE. Further, a cellular electrophysiological approach is required to investigate the mechanism of action of KYNA on abnormal synaptic transmission associated with DRE.

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Neuroimaging

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Regional gray matter density associated with intellectual ability in newly diagnosed pediatric epilepsy

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Purpose: Epilepsy patients often have cognitive dysfunction, which may be linked to their cortical abnormalities of specific brain regions. This study aimed to investigate the relationship between neuropsychological status and structural brain changes in children and adolescence with newly diagnosed epilepsy.

Method: Thirty newly diagnosed pediatric epilepsy patients and 25 healthy control subjects aged 7 to 16 were enrolled. All subjects were assessed by the Korean version of the Wechsler Intelligence Scale for Children (K-WISC III), the Stroop and Trail-making tests (TMT). Optimized voxel-based morphometry (VBM) was used to compare the differences of gray matter (GM) and white matter (WM) densities between epilepsy and control groups.

Results: Even in newly diagnosed epilepsy patients of childhood and adolescent ages before AED use have lower intelligence and poorer executive functions compared with healthy controls. In addition to poor neuropsychological performance, VBM analysis showed decreased GM density mostly in the bilateral frontal areas but no WM density change in the patients group. There were positive correlations between freedom from distractability scores and GM density of the left postcentral gyrus in the patients group.

Conclusion: we have found evidence for the impaired neuropsychological performance, accompanied by microstructural changes of GM density using optimized VBM analysis in children and adolescence with newly diagnosed epilepsy. Interestingly, GM density changes were predominantly demonstrated in bilateral frontal regions. Our findings of regional GM density changes, especially in the bilateral frontal regions could further support the pathophysiological concept of the functional and structural abnormalities in newly diagnosed pediatric epilepsy. It strongly suggests that pediatric epilepsy patients are affected their intellectual ability and this abnormality might be an early insult from broad syndromes of epilepsy in the rapidly growing young brain

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Ictal F18-FDG PET in status epilepticus: a valuable presurgical tool in selected patients with status epilepticus (SE)

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Purpose: Epilepsy surgery of refractory SE could be challenging. To identify the epileptogenic focus is very difficult because the EEG does not show clear-cut focal epileptiform abnormalities. Ictal 18F-FDG-PET is useful in delineating the epileptogenic area in view of possible resective surgery.

Method: Patients with refractory SE who had ictal PET, MRI and EEG monitoring were studied. All PET scans were conducted after the radiotracer was injected under EEG recording during ongoing SE. Epilepsy surgery was performed in selected cases guided by localizing information from ictal EEG, MRI and ictal PET data.

Results: Ictal F18-FDG-PET was obtained in 6 cases (M 3, F 3), who have refractory SE.

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Ictal PET was used as crucial localizing information together with MRI brain and EEG to make a decision for epilepsy surgery. Two cases had concordant localizing information of ictal PET and MRI data, but ictal PET provided more delineating localizing information. One case had a lesion demonstrated on the MRI, which on the wrong site, but ictal PET provide correct localizing information concordant with EEG data. One case had ictal SPECT that showed no localizing information, but ictal PET provided a correct localization. Three cases underwent for epilepsy surgery and all became seizure-free post-operatively. Ictal PET also showed well localizing information of the epileptogenic focus in cases who did not go for epilepsy surgery, because the refractory SE was stopped beforehand.

Conclusion: Ictal PET is valuable tool used to identify the epileptogenic focus in refractory SE. It provided delineating localizing information that helps for planning epilepsy surgery in selected cases with refractory SE. A concordant data of a localizing information from ictal PET, ictal EEG and MRI provided a good surgical outcome. Also, the information of ictal PET in SE gives an understanding of a pathophysiology during the SE.

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Effect of seizure frequency on the properties of functional brain networks: novel observations in patients with drug naive hot water epilepsy

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Purpose: Frequency of seizures could be an important factor which can alter the properties of functional brain networks. To explore this possibility, we applied graph theoretical approach to resting state functional MRI networks in 36 drug naïve patients with hot water epilepsy (HWE) and 18 matched healthy controls avoiding potential confounds of anti-epileptic drugs.

Method: The patient group consisted of 18 patients with frequent seizure (>2/month) and 18 patients in the infrequent seizures (≤2/month). The SPM8 preprocessed data was used to derive the small world connectivity metrics {clustering coefficient (C), path length (L) and nodes (N)} and the regions which showed significant differences (FDR corrected $p < 0.05$) between healthy controls and frequent seizure group were used for seed to voxel based connectivity analysis in CONN.

Results: Patients with frequent seizures showed several regions with increased C and L in comparison with the healthy controls. Seed based connectivity analysis revealed that HWE with frequent seizures had several regions with poor connectivity even involving the default mode network (DMN) in comparison with the infrequent seizure group. Though the infrequent seizure group was similar to the healthy controls in majority of seeds and had preserved default mode network connectivity, some seeds revealed lesser connectivity.

Conclusion: The present study, first of its kind, suggests that increased seizure frequency does alter the functional brain networks. It could be inferred that infrequent seizures and adequate seizure control in patients might modulate the areas with altered connectivity and could potentially preserve the network connectivity.

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Clinical spectrum and neuroimaging in infants and children with malformations of cortical development

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Purpose: Malformation of cortical development (MCD) include wide range of neurodevelopmental disorders.

Aim of work: To present the clinical spectrum of MCD in relation their identified types, EEG & neuroimaging data.

Subject & methods: Forty five cases with MRI findings of MCD, aged from 14 days - 4 years, were subjected to clinical evaluation and electroencephalography. Electromyography and nerve conduction, visual evoked potential, auditory brain response, echocardiography, abdominal ultrasound, karyotyping, TORCH screening, extended metabolic screening TMS/MS, lactate level were done (7 cases each), glycose aminoglycan in urine and creatine phosphokinase level (one case each).

Results: lissencephaly / pacchygyria spectrum compised 57.8% of cases schizencephaly (17.8%), polymicrogyria (13.3%), tuberous sclerosis (TSC) (6.7%), hemimegalencephaly & holoprosencephaly (2.2% each). Microcephaly was present in (77.7%), seizures occurred in (24.4%): infantile spasm 2 cases (4.4%), multiple seizure types 7 cases (15.5%), myoclonic seizures (4.4%) and they were refractory in 7 cases. Suggested etiologies were; TSC in 3 cases (6.7%), Klipple Trenauny, muscle eye brain disease (MEBD), CMV infection and prenatal insult one case each

Conclusion: MCD should be considered among patients with developmental delay, microcephaly and seizures. Lissencephaly was the commonest followed by schizencephaly. Microcephly & refractory seizures were more significant among cases with lissencephaly/ pacchygyria compared to other types of MCD. Aetiolgical diagnosis such as TSC ,MEBD, TORCH infection are important for management. Molecular diagnosis of MCD is necessary, hence prenatal diagnosis

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Increased interhemispheric resting-state functional connectivity in juvenile myoclonic epilepsy: a resting-state fMRI study

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Purpose: Whether the functional connectivity between brain regions is changed between the cerebral hemispheres in patients with juvenile myoclonic epilepsy(JME) remains unknown. The aim is to examine the resting state functional connectivity (RSFC) between the two hemispheres and its relationships with clinical characteristic in JME patients using a technique called ''voxel-mirrored homotopic connectivity (VMHC)''.

Method: The Resting-state functional MRI (Rs-fMRI) was used to measure the RSFC in patients with JME and age and gender matched healthy subjects. The between-group differences in interhemispheric RSFC were examined after the interhemispheric RSFC map was obtained by an automated VMHC approach.

Results: Compared to the controls, the JME patients showed significant increases in VMHC in the bilateral thalamus, anterior cingulate, occipital lobe, in addition to the sensorimotor regions

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including the postcentral_and precentral gyrus, supplementary motor area. No areas showed decreased VMHC in patients. Moreover, the VMHC in prefrontal cortex including middle and superior frontal gyri showed significant negative correlations with the illness duration.
Conclusion: The current findings provide preliminary evidence of increased interhemispheric RSFC in patients with JME during the iterictal period. The increased VMHC could play an important role in the pathophysiology of JME. The significant inverse relations between VMHC and clinical characteristic in JME may suggest potential clinical implication of VMHC measure for JME. Our study may contribute to the understanding of neuro-pathophysiological mechanism of epilepsy in patients with JME.

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The role of ^{11}C-Methionine positron emission tomography to detect epileptogenic tuber in the patients with tuberous sclerosis

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Purpose: 18F-fluoro-2-deoxy-D-glucose (FDG) positron emission tomography (PET) is an important tool to detect epileptogenic region. Interictal FDG-PET shows lower metabolism in epileptogenic area. However, each tuber shows lower metabolism in case of tuberous sclerosis with multiple cortical tubers. Amino acid tracer, 11C-Methionine (Met)-PET is useful in diagnosis with glioneural tumor and low grade tumor which cause epilepsy. We evaluate the role of Met-PET for presurgical assessment of the patients with intractable epilepsy.
Method: We examined five patients with tuberous sclerosis (one male and four female, from one to 18 y.o.). Three patients had intractable epilepsy. The seizure was not intractable in one patient, and another one patient had intracranial tumor without seizure. We made tracer distribution image according to standardized uptake value (SUV) and evaluated tracer uptake by the lesion-to-contralateral ratio.
Results: All five patients showed lower uptake around cortical tubers in FDG PET. In three patients with intractable epilepsy, Met-PET showed higher uptake in tuber only related with epileptogenic area, nevertheless the other tubers had lower uptake. Two patents without intractable epilepsy had lower accumulation in Met-PET. One of two patients had subpendymal giant cell astrocytoma, and Met-PET showed higher uptake in the tumor. In three patients with intractable epilepsy, we assessed epileptogenic lesion with other usual presurgical evaluation and resect epileptogenic zone including Met-positive tuber. The seizures were disappeared after surgery.
Conclusion: Higher uptake of 11C-Methionine in PET might indicate epileptogenic lesion. This would help to detect epileptogenic region in the patients with tuberous sclerosis.

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Increased interhemispheric resting-state functional connectivity in idiopathic generalized epilepsy with generalized tonic-clonic seizures: a resting-state functional Magnetic Resonance Imaging study

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Purpose: The aim is to examine the resting state functional connectivity (RSFC) between the two hemispheres and its relationships with clinical characteristics in idiopathic generalized

epilepsy with generalized tonic-clonic seizures only (IGE-GTCS) patients using a technique called ''voxel-mirrored homotopic connectivity (VMHC)''.
Method: The Resting-state functional Magnetic Resonance Imaging (Rs-fMRI) was used to measure the RSFC in patients with IGE-GTCS and age-gender matched healthy subjects. The between-group difference in interhemispheric RSFC was examined after the interhemispheric RSFC map was obtained by an automated VMHC approach.
Results: Compared to the controls, the IGE-GTCS patients showed significant increases in VMHC in the bilateral anterior cingulate, medial prefrontal gyrus, in addition to corpus callosum. No areas showed decreased VMHC in patients. Moreover, the VMHC in bilateral thalamus, orbital frontal cortex as well as cerebellum showed significant negative correlations with the illness duration.
Conclusion: The current findings provide preliminary evidence of increased interhemispheric RSFC in patients with IGE-GTCS during the interictal period. These VMHC deficits in these regions and the inverse relations between VMHC and clinical characteristics may play an important role in the pathophysiology of IGE-GTCS and behavioral changes in patients. Our study may contribute to the understanding of neuro-pathophysiological mechanism of epilepsy and psychosocial function impairments in patients with IGE-GTCS.

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Biochemical and molecular profile of leukodystrophies in infancy and childhood

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Purpose: Leukodystrphies are group of disorders affecting the white matter with genetic background.
Aim of work: To highlight the clinical manifestations among cases with leukodystrophy and to present their etiological classification according to neuroimaging, laboratory work up; genetic basis and prenatal diagnosis.
Materials & methods: The study included forty cases with MRI findings of white matter diseases and their age ranged from 6ms-12ys. Electromyography and nerve conduction were done for 12 cases, organic acid profile in urine (21 cases) and quantitative analysis of N acetylaspartate in urine for (5 cases). Galactocerebrosidase activity were done for (12cases), arylsulfatase activity for (12 cases), very long chain fatly acid (VLCFA) assay in 8 cases, cortisol level and ACTH (7 cases). Mutation analysis for Aspartoacylase (ASPA) gene were done for two families with Canavan disease and prenatal diagnosis. Molecular diagnosis for Leber's amaurosis for one case and prenatal diagnosis.
Results: Cases were classified into Canavan disease (13 cases), Metachromatic leukodystrophy (8 cases), Adrenoleukodystrophy (7cases) leukoencephalopathy with subortical cysts (4 cases), Vanishing white matter disease (one), Lebers Amaurois (one) and possibility of Alexander's disease (4 cases). Molecular diagnosis for ASPA gene coding aspartoacylase showed homozygous mutation in exon 5:c.697 dup: diagnostic for Canavan disease (2 cases) & their parents were heterozygous state. Prenatal diagnosis for 2 mothers for the identified mutation showed homozygous Canavan disease (one) and carrier for Canavan (one). Molecular diagnosis confirmed Lebers Amaurosis in one case and prenatal diagnosis revealed normal fetus.
Conclusion: MRI is an achievement for identifying white matter diseases. Enzyme activity, organic acid profile in urine and VLCFA assay are helpful in the aetiological classification of leukodystrophy. Gene mutation analysis is mandatory for confirmation & hence prenatal diagnosis.

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Diagnostic test study of Indonesian version of the neurological disorders depression inventory for epilepsy in adult epilepsy patients with major depression disorders

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Purpose: To determine the accuracy and cut-off point of NDDI-E Indonesian version as a screening depression examination for adult epilepsy patients.
Method: Diagnostic test study was conducted at epilepsy clinic on RSCM. All the epilepsy patient who met the inclusion criteria was examined. The patient took the NDDI-E Indonesian version as a self assesment. Then there were assest with used the International Neuropsychiatric Interview Mini ICD-10 (MINI-ICD10) as a gold standard.
Results: From the 105 subjects, there were 23 people suffered from major depression by MINI-ICD10. Receiver Operating Characteristic (ROC) curve obtained which is close to 100%, cut-off point at 11, with Sensitivity 91.3% Specificity 89% PPV 70% and NPV of 97.3%. It was statistically classified as strong because the value of Area Under the Curve (AUC) is 97.5% with a confidence interval (95% CI 95% -99%).
Conclusion: NDDI-E Indonesian version has a high accuracy to determine major depressive disorder in adult epilepsy patients with the cut-off point at 11.

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Gender differences of depressive symptoms in patients with focal epilepsy

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Purpose: In human population severe depression occurs two times more often in women than in men and mild - 7-8 times more often. The aim of this study was to compare the severity and frequency of depressive symptoms in men and women with focal epilepsy.
Method: 53 patients (28 men and 25 women) with focal epilepsy took part in our study. All of them took anticonvulsant drugs (2-3). The seizure frequency was 6 and more seizures during 8-week period. The depressive symptoms were estimated using the Center for Epidemiologic Studies Depression Scale (CES-D).
Results: At the time of investigation 21% (6 from 28) and 28% of women (7 from 25) had expressed depression according to the CES-D scale (more than 25 points). No gender difference in depression severity was observed. An average CES-D score for women in the depression group was 33.2±8.7, for men-31.0±6.4.
Conclusion: Our findings show there are almost no gender differences in depression frequency and severity in patients with focal epilepsy.

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Prevalence of pervasive developmental disorders (PDDs) in siblings of children with PDDs: a cross sectional study from a developing country

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Purpose: Multiple lines of evidence indicate a strong genetic contribution to PDDs manifesting as increased risk in siblings. However there is no Indian data available on this, hence this study

was done.
Method: This study was done at tertiary care hospital in India. Patients of PDD who had siblings in the age group 2-14 yrs were approached. Siblings in the age group 2-4 years were screened using Modified Checklist for Autism in Toddlers (M-CHAT), and those in the age group 4-14 years were screened using Social Responsiveness Scale (SRS), parent version.For Hindi-speaking population, pre-tested Hindi translations of both the questionnaires were used. Screen positive siblings were assessed using DSM-IV criteria by a Developmental Pediatrician. Risk of PDD in siblings was correlated with various familial and disease characteristics of the index case.
Results: 204 siblings (104 females/100 males) were screened (34-MCHAT and 170-SRS). 13 were screen positive. 3 were lost to follow up. Rest 10 who were assessed on DSM-IV criteria were classified as PDD-NOS (3) and Autism (7).Prevalence of PDD in siblings was 4.97%. There was a significant effect of the presence of aggressive behaviour, externalizing and total problems in proband [as assessed by Childhood behaviour checklist (CBCL), and the young age of father at conception on the sibling risk of PDD.
Conclusion: The previously described increased risk of PDD in siblings of patients with PDD is also seen in our population. Thus genetic counselling of family for increased risk and routine screening of siblings should be done with the diagnosis of children with PDD.

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Difference outcome of neuropsychological factors depending on the surgical outcome in temporal lobe epilepsy
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Purpose: Surgery for temporal lobe epilepsy is effective therapeutic option for intractable epilepsy, with 70-80% of patients demonstrating favorable seizure outcome (Engel class I). Most studies have consistently demonstrated improvements in various neuropsychological domains in those patients. However there is very little information about the neuropsychological outcome in the patients that the seizures remain after operation. We examined correlation between the result of neuropsychological factors and the surgical outcome of temporal lobe epilepsy.
Method: We listed 14 patients with temporal lobe epilepsy who had resective surgery from 2007 to 2011 (18-51 y.o. at the operation) in our hospitals (Kagoshima University Hospital and Fujimoto General Hospital). We classified the patients into 2 groups: Verbal dominant TLE: 6 patients and Non dominant TLE: 8 patients. All patients had neuropsychological examination at preoperation / 3months after operation / 2 years after operation. Each patient had WAIS-R/III, WMS-R, WCST, Benton Visual Retention Test as neuropsychological examinations
Results: In 12 out of 14 patients, WCST score improved regardless of seizure free or not. Multifactor of WAIS-R/III was decreased in 3 of 4 patients who had seizures within 2 years after operation non-dominant side. In 8 patients who demonstrated favorable seizure outcome, postsurgical IQ was improve after temporal lobectomy, regardless the resective side and dominant/non-dominant. In WMS-R visual memory tended to decrease in patients who had right temporal lobectomy. The scores of Benton Visual Retention Test tended to decrease in patients who experienced right temporal resection.
Conclusion: Poor surgical outcome with non-dominant side resection was related to IQ decline. Frontal lobe function improved even if seizure remained, and the decrease of seizures may improve brain function. Visual spatial(non-verbal) memory declined after temporal lobectomy in right hemisphere.

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Analysing role of expressed emotions as a mediating variable for stigma and co-morbid depression as experienced by patients with epilepsy (PWE)

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Purpose: Feeling stigmatized or having co-morbid depression on the part of PWE may significantly influence epilepsy care and treatment, an important contributory factor to which can expected to be expressed emotions(Critical, Hostile & Emotional over-involvement)from family, friends or society. The present study aims to understand the influence of expressed emotions, as exhibited by close relatives, on the perception of stigma and co-morbid depression experienced by PWE.

Method: 80 PWE consenting, aged 18 yrs and above, both M/F, visiting neurology OPD in AIIMS Hospital, along with one primary care giver were recruited. Using PHQ-09 questionnaire, they were subdivided into Group I (PWE with co-morbid depression) and Group II (PWE without co-morbid Depression), followed by administration of Levels of Expressed Emotions Scale (Cole, 1988) and Stigma Scale for Epilepsy (Fernandes, 2007) respectively.

Results: The comparative analysis, using independent-t test (for categorical data) and Pearson correlation (for continuous data), reflected significant influence of Expressed Emotions, on depression and stigma with more than 20% of participants, reporting co morbid depression, out of which more than 50 % further expressed feelings of inferiority or disgrace due to the ways in which family or society discriminated them from normals, thereby highlighting a greater influence of High EE as opposed to low Expressed Emotions from key caregiver, on patient's perception of Stigma or feeling of depression.

Conclusion: The expressed emotions from a relative might go unnoticed but may significantly overwhelm the patient, thereby making him succumb to depression or feeling stigmatized. The analysis of such clinical profile and relationship between EE and perceived stigma / depression may help us understand the pattern of attribution styles adopted by PWE thereby utilizing it further for enhancing the efficacy of CBT for facilitating sustained recovery and improved quality of life for PWEs.

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Personality profiles (Minnesota Multiphasic Personality Inventory II) of patients with psychogenic nonepileptic seizures with reference to significance on prognosis in Tertiary care center of developing country, India

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Purpose: Personality traits of psychogenic non-epileptic seizures (PNES) were found to have effect on its predisposition as psychopathology was found to have an impact on stress coping. Even the response to treatment depends on underlying psychopathology. There were less studies to address these aspects, especially in India. Our aim was to study various personality traits of patients with PNES presenting to Nizam's Institute of Medical Sciences and their correlation of them with classification of PNES & treatment response. To see whether there is any correlation of prognosis to Psychopathology or PNES classification.

Method: 52 consecutive patients with PNES who attended activation clinic of Nizam's Institute of Medical Sciences were given the Minnesota Multiphasic Personality Inventory 2 (MMPI-2) questionnaire to assess the personality trait and were followed up in outpatient department

and over telephonic enquiry for improvement. Prolonged Video EEG assessment was done to classify the PNES according to Seneveratine et al. into Hyper motor, minor motor, complex motor, dialeptic and mixed PNES.

Results: Basic scale analysis showed paranoia (86.53%), Depression (51.92%), hysteria (48.07%). Content scale analysis showed health concerns (88.46%), bizarre mentation (67.30%) and negative treatment indicators (57.69%). Supplementary scale analysis indicated significantly more posttraumatic stress disorder (67.30%), marital distress (32.69%). Subscale analysis showed somatic complaints (90.38%), persecutory ideas (90.38%) physical malfunctioning (86.53%).

Conclusion: Profile analysis revealed that personality pattern of patients with PNES was characterized by tendency towards paranoia, Health concerns, posttraumatic stress disorder and negative treatment indicators which had treatment implications. They found to have anxiety, neurotism, less frustration tolerance index and high maladaptive practices. Those with negative treatment indicators, Depression, Bizarre mentation were found to have refractoriness to treatment. Classification of PNES had correlation to psychopathology and to prognosis which might had treatment implications. Treatment directed to specific psychopathology might help in prognosis of these patients.

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Neuropsychological and psychopathology correlates of children with epilepsy

CHOPRA S[1], NEHRA A[1], KAUR H[1], BAJPAI S[1], TRIPATHI M[2], CHILDREN WITH DRUG REFRACTORY EPILEPSY

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Purpose: Epilepsy affects about 100,000 persons every year in India (Indian Epilepsy Centre, 2014). Children with epilepsy can have poor school performance due to frequent seizures and effect of antiepileptic drugs. Neuropsychological impairment is an important co-morbidity of chronic epilepsy (Elger et al., 2004). There have been a very few studies from India which focus on the Neuropsychological and psychopathology correlates of children with epilepsy.

Method: 34 children with temporal and extra temporal epilepsy aged 7-12 years were studied cross-sectionally, with Indian standardized Neuropsychological tools for intellectual functioning, cognitive functioning. Both M/F, right/left-handed, educated/uneducated diagnosed as having drug refractory epilepsy were assessed. The tools used were PGI Memory Scale for Children (Kohli et al., 1998) and Gesell's Drawing Test (Verma et al., 1972).

Results: Results indicated significant impairment in nine areas of cognitive functioning, namely immediate recall (p= 0.001), followed by delayed recall (t= 7.64), attention and concentration (t= 7.19), recent memory (t= 5.48), remote memory (t= 4.09), visual retention (t= 3.70), retention for similar pairs (t= 3.71), mental balance (t= 3.03), recognition (t= 2.90) as compared to age matched controls. On intellectual functioning, the mean IQ was found to be 93.6. 9 children had above average IQ, 10 were average, 5 were low average, 3 borderline and 7 had mild Mental Retardation. Psychopathology was measured subjectively by a trained neuropsychologist by the means of evidence of perseveration and wide intrascatter of scores. 12 children showed an indication of psychopathology.

Conclusion: Epilepsy and anti-epileptic drugs can induce neuropsychological impairments and psychopathology in the developing brain. There is a significant impairment in cognition of such children. A limitation of the study is that the pre-morbid functioning of the children was not known. Due to a small sample size, generalizations cannot be made for which a larger cohort study is needed.

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Is stigmatized epilepsy disabling? The trio impact of stigma, disability and quality of life

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Epilepsy is one of the most common stigmatized disorders in India with lots of misconceptions, superstitions and fears revolving around thereby affecting physical, emotional, psychological, social and economic spheres of well being and ultimately leading to impaired quality of life, thus, making it a disabling neurological condition.

Purpose: To study and measure the prevalence of epilepsy in India, the impact of the stigma on QOL of patients with epilepsy & the prevalence of neurological disability due to stigmatized epilepsy.

Method: a prospective study with a sample of 208 Persons with epilepsies (PWE) both males & females was planned up. Neuropsychological tests were used to measure disability using, Indian Disability Evaluation Assessment Scale (IDEAS) and Quality of life using Dysfunctional Analysis Questionnaire (DAQ) while stigma was assessed using The Stigma Scale for Epilepsy (SSE).

Results: Spearman correlation was calculated where, stigma (SSE) was highly significant with the quality of life (DAQ) (0.019*) & disability due to stigmatized epilepsy (IDEAS) (0.011*) with 42.30% of prevalence of patients were found to be stigmatized due to epilepsy.

Conclusion: The present study supports the global perception of stigma associated with epilepsy & its negative impact on their overall quality of life and contributing to the escalation of the disease burden.

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The altered conscious level in patients with focal epilepsy

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Epileptic seizures are characterized by a multifaceted spectrum of alterations in the general level of awareness and consciousness. Complete loss of consciousness occurs when epileptic activity involves both cortical and subcortical structures, as in generalized seizures. On the other hand, simple partial seizures can spare both the level and contents of consciousness. Using ictal neuropsychological examination in pre–surgical patients with focal epilepsies, we examined the localizing value of the constituent functions of consciousness as opposed to 'conscious behaviour' as a unitary variable. The constituent functions of consciousness examined included the orientation to the examiner, intentional behaviour demonstrated by expressive or receptive speech, and postictal memory. Frequency and patterns of impairment of constituent functions and 'conscious behaviour' were assessed.

To study this, pre - surgical Long Term Video - EEG recordings (n = 40) of ictal neuropsychological assessments were reviewed retrospectively. Patients were divided into four groups with frontal (n = 10), right temporal (n = 10), left temporal (n = 10) and bitemporal (n = 10) seizure activity.

There were different patterns of impairment of the assessed constituent functions in the four groups: patients with frontal seizure activity showed loss of orientation and expressive speech whereas patients with left temporal seizure activity had impairments of memory, expressive and receptive speech. Patients with seizure activity limited to the right temporal lobe rarely exhibited ictal impairment of any of the assessed functions. In contrast, patients with bitemporal seizure activity showed impairment of all examined functions. Hence, normal functioning of the left temporal lobe or both temporal lobes is necessary for the preservation of all constituent aspects of consciousness.

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Effects of mulberry and cornelian cherry extracts on epileptiform activity induced by penicillin

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Objective: It was aimed to evaluate effects of mulberry and cornelian cherry extracts on penicillin-induced epileptiform activity.
Methods: To assess effects of mulberry and cornelian cherry extracts Group 1 (control), Group 2 (sham) and Group 3 (penicillin) were assigned. Epileptiform activity was induced by using penicillin model and stabile amplitude and spike frequency was obtained by electrocorticograph recordings. Then, penicillin plus mulberry extract (2,5 - 5 -10 - 20 mg/kg) were intraperitoneally given to groups 4, 5, 6, 7 whereas penicillin plus cornelian cherry extract (2,5 - 5- 10 - 20 mg/kg) to groups 8, 9, 10, 11, respectively. The effective dose that decreased amplitudes and spike frequencies of convulsions was determined and blood samples were drawn.
Results: 10 mg/kg was detected as effective dose for both mulberry and cornelian cherry extract. While no significant difference was detected between groups in amplitude studies, it was found that spike frequency of epileptiform activity was decreased by both substances.There was significant difference regarding malonyldialdehyde in sham-control ($p< 0.001$), penicillin-control ($p< 0.001$), penicillin-sham ($p< 0.001$), penicillin-cornelian cherry ($p< 0.001$), penicillin-mulberry ($p< 0.001$) and mulberry-cornelian cherry ($p< 0.001$) groups.In the plasma, there was a significant difference groups regarding xanthine oxidase in penicillin-cornelian cherry ($p=0.008$) and penicillin-mulberry ($p=0.02$) groups. There was difference regarding malonyldialdehyde in penicillin-cornelian cherry ($p< 0.001$) and mulberry-cornelian cherry ($p< 0.001$) groups.
Conclusion: Mulberry and cornelian cherry extracts decreased the frequency of epileptiform activity as well as malonyldialdehyde level in both erythrocytes and plasma. Nitric oxide was also reduced by stress and epileptic activity in erythrocytes but didn't elevated by administration of mulberry and cornelian cherry extracts.

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The faces of untreated epilepsy in Nepal

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Purpose: To illustrate the human impact that IBE member collaboration can have on the quality of life of patients in developing nations.
Method: In September 2013, a collaboration between the Hemav Rajbhandari, Nepal Epilepsy Association, Janita Keating, Epilepsy Foundation (Australia) and Dr Victor Patterson, neurologist, Belfast (UK) enabled epilepsy patients to be seen in isolated West Nepal villages through clinical outreach clinics. The international collaboration involved sharing of clinical and educative expertise.
Results: To coin an old phrase, 'a picture can say a 1000 words': the photographic representations from these clinics poignantly illustrate the high stakes involved when epilepsy in untreated in developing nations.
Conclusion: Both developed nation and developing nation IBE members should actively look at ways to work collaboratively to bring epilepsy out of the shadows as the number of untreated

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epilepsy patients in developing nations is large and the quality of life implications are often severe. These partnerships need to be based on practical, self-sustaining and respectful approaches.

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How effective are epilepsy camps in treating untreated epilepsy?

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Purpose: Epilepsy camps are the traditional way of identifying people with untreated epilepsy. This study aims to examine how completely they do this.
Methods: An epilepsy camp was performed in Tatopani in the Myagdi district of Nepal. It was attended by a local neurosurgeon (HR), a medical officer (MP), an EEG technician and a pharmacist together with a visiting neurologist (VP) and an epilepsy educator (JK). The camp was advertised in advance using local radio and by word of mouth through local health workers. Following the camp a researcher (CP) visited four villages and ascertained from the local health workers the numbers of people with possible epilepsy. Patients were seen where possible and the probability of epilepsy calculated by a phone app. Patients identified were offered an appointment with HR.
Results: Eight people with possible epilepsy were identified and six were visited. Four had active epilepsy and three were untreated. Three of these four did not know about the camp and one could not arrange to attend. One patient from the four villages visited had attended the camp.
Conclusion: Only one of five people with active epilepsy had attended this camp suggesting that it was not an efficient method of treating active epilepsy in a community. Although epilepsy camps run by doctors are the "gold standard" in managing untreated epilepsy, better ways to close the epilepsy treatment gapare needed.

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Eating epilepsy and involvement of peri-sylvian network: a multi-modal approach

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Objective: The aim was to study the correlates of reflex eating epilepsy using multimodality investigations.
Methods: Two women (age: 26&24; onset: 10&15 years) with drug-resistant eating epilepsy underwent MRI (brain), video-EEG, SPECT/PET, simultaneous fMRI-EEG and EEG-MEG.
Result: The semiology in patient-A consisted of neck flexion, speech arrest, clonic movement of right half of face and salivation. MRI showed left fronto-parietal perisylvian gliosis. EEG revealed left fronto-central sharp waves; ictal EEG revealed left parieto temporal ictal slowing. Ictal SPECT showed left fronto-parietal hyperperfusion. PET showed left temporo-frontal hypometabolism. Source modeling of EEG-MEG spikes showed significant clustered dipoles/activity in the left deep peri-sylvian region. The 'ictal' EEG-MEG showed build
of rhythmic theta activity in the left temporo-parietal and in the right temporal sensors; source localization showed dipole clusters in left peri-sylvian and temporal regions propagating to either frontal lobe or posterior temporal lobe. The fMRI-EEG showed activity in left parietal, lentiform, superior temporal, & superior/medial frontal regions corresponding to focal EEG discharges. The semiology in patient-B consisted of hypomotor state, speech arrest, and salivation. MRI showed bilateral peri-sylvian polymicrogyria. EEG revealed left temporo-central discharges; ictal EEG showed runs of spikes across T5 with spread to T3,O1 regions. PET showed hypometabolism of left temporal region. Source source localization of EEG-MEG spikes showed clustered dipoles/

activity in the left basal/medial temporal lobe. The fMRI-EEG showed activations in cerebellar hemispheres associated with generalized discharges; and activations corresponding to focal discharges were noted in the left cerebrum, temporo-parietal and insula regions.
Conclusions: Abnormal network involving the perisylvian region might play a major role in eating epilepsy.

p205
Neuroprotective potential of hesperidin in pentylenetetrazol induced kindling and associated cognitive impairment; Possible modulation of NO-cGMP pathway
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Introduction: Nitrosative and oxidative stress have been proved to play a detrimental role in the pathophysiology of epilepsy. Pentylenetetrazole (PTZ) kindling represents the best model of epileptogenesis and to some extent epilepsy induced cognitive deficits. The present study has been undertaken to evaluate the possible neuroprotective mechanism of hesperidin, a potent antioxidant, against chronic PTZ-induced kindling and associated cognitive dysfunction in mice.
Methods: Sub-convulsive doses of PTZ (40 mg/kg, i.p.) have been administered on every alternate day for period of 12 days, and seizure episodes were noted after each PTZ injection over a period of 30 min. The memory performance tests were carried out on day 13 and 14 followed by the estimation of biochemical and mitochondrial enzyme assays.
Results: Chronic administration of sub-convulsive dose of PTZ resulted in an increase in convulsive activity culminating into generalized clonic-tonic seizures, as revealed by a progressive increase in seizure score as well as alteration in antioxidant enzymes levels (lipid peroxidation, nitrite, glutathione, super oxide dismutase and catalase) and mitochondrial complex (I, II and IV) activities. Whereas chronic treatment with hesperidin (200 mg/kg) significantly attenuated these behavioral, biochemical and mitochondrial alterations. Further, treatment of L-arginine (100 mg/kg) or L-NAME (10 mg/kg) in combination with hesperidin significantly modulated the protective effect of hesperidin which was significant as compared to their effects *per* se in PTZ treated animals. Combination of L-NAME with a lower dose of hesperidin shown 100% protection over mortality.
Conclusion: The above findings suggest a possible involvement of NO-cGMP pathway in the neuroprotective effect of hesperidin against epilepsy and associated cognitive deficit.

p206
A case series study on clinical profile of children with neurocutaneous syndromes
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Aim: To study the clinical profile of children with neurocutaneous syndromes and their various symptomatology, the seizure types and the response to treatment.
Subjects and Methods: A retrospective crosssectional study was conducted in the Department of Paediatrics, Pushpagiri Medical College Hospital,Tiruvalla, during the period from January 2013 to June 2013. Children between the age group 0 and 15 years were included in the study on the basis of standard diagnostic criteria for different NCS. Investigations done were CT,MRI ,EEG,and skin biopsy for appropriate cases.
Results: The study population comprised of 10 children (5 boys, 5 girls). The various forms of NCS observed were Sturge Weber syndrome (SWS) - 4 Neurofibromatosis (NF1)- 2 , Hypomelanosis of Ito (HOI) - 2, Tuberous sclerosis complex (TSC) - 1 , and Incontinentia

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pigmenti (IP) · 1.A total of 8 children (80%) presented with neurological symptoms and the remaining 2 (20%) presented with cutaneous symptoms of which 1 was found to have learning disability on evaluation.The neurological problems were,70 % had seizures of which100% were SWS and TSC , 50% were HOI and NF1 .72% had generalised tonic clonic seizures (GTCS) and 28% had focal seizures. The child with TSC showed refractory epilepsy. Developmental delay was detected in 50% of cases and maximum delay was seen in HOI. Family history of the same disease was obtained in 2 cases (50% of NF1 and 100 % of IP).
Conclusions: The leading NCS in this study was SWS.70% of children with NCS presented with seizures. The commonest type of seizure among them is GTCS.Children with TSC had seizures refractory to anticonvulsants. Careful evaluation of NCS children can reveal problems like Learning disabilities.

p207
Robotics in neurosurgical stereotactic interventions: oblique intrainsular electrodes implanted of patients with epilepsy
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Objective: This study is to investigate the feasibility, the safety and the utility of chronic depth electrodes stereotactically implanted by a robotic arm in the insular cortex of patients suffering from drug refractory focal epilepsy.
Methods: A total number of 32 electrodes in 29 patients *(in Grenoble University Hospital)* were successfully implanted within the insula. 220 contacts were available for insula recording. Electrode insertion was guided by a robotic arm *(Neuromate, Renishawmayfield, Switzerland)* connected to the stereotactic frame and driven by stereotactic planning software. The targetting of the insula is planned on a pre-surgical T1-MRI. The fusion between the preoperative 3D MRI and the postoperative 3D CT scan enabled us to identify the contact location in three dimensions.
Results: No morbidity occurred during the surgical step and the chronic SEEG recording or stimulation procedure. Clinical responses have been identified in terms of gyral and sulcal anatomy. They were classified into: painful responses, sensitivomotor responses, speech disturbance, oropharengeal responses, auditory phenomena and neuro-vegetative phenomena.
Conclusion: The advantages of the oblique approach are:
1. The implantation of electrodes within the insula using robotic arm appears in our study to be safe.
2. This approach can explore all insular regions by avoidance of the sylvian vascular network.
3. This approach offers a better sampling of insular EEG activity (until 10 contacts/electrode) than that obtained by the classical lateral trans opercular approach (1 ½ contacts/electrode).
4. Thisapproach has allowed us to develop the first anatomo-functional organization scheme of the insular cortex according to its gyri and sulci.

p208
Scenario of epilepsy patients in Khulna, Bangladesh
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Purpose: To evaluate and compare the data of Epilepsy patients in our center.
Method: The referred cases of epilepsy were enrolled in the ´Epilepsy Clinic´ from November, 2012 to February, 2014. Clinical diagnosis was made by taking the history meticulously and doing clinical examination. Routine EEG and MRI was adviced and after getting the result interpreted.

Results: Among 115 patients, 6 are suffering from IGE, 9 from Symp.GE (3 from West Syndrome), 1 from Simple Partial Sz, 4 from Partial Sz with sec. generalization, 29 from TLE, 52 from CPS-ET, 1 from Sturge Weber Syndrome, 1 from CAE, 1 from JME, 2 from EPC, 1 from Gelastic Sz, 2 from Reflex Sz, 1 from Tuberous Sclerosis Complex and 4 from Pseudo-Seizure.
Conclusion: In contrast with other results here TLE is 33.7% and CPS-ET is 60.5% among all the partial seizure patients. The proportion of CPS appears to be higher in comparison to other studies. This result demands further study in big sample in this area.

p209
Multiple sclerosis presenting with seizures: a case presentation
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Purpose: We aim to present a case with Multiple sclerosis (MS) presenting with seizures as first symptom.
Method: Multiple sclerosis (MS) is an inflammatory demyelinating disease of the central nervous system (CNS). Multiple sclerosis (MS) presenting with seizures as first symptom is uncommon.
Case: A 36 years old male doctor-patient was admitted to our clinic due seizures. His medical history and neurological examination was normal. MR examination of brain demonstrated well-defined upright and perpendicular to ventricles round hyperintense lesions on T2-weighted images on the parietal, frontal, temporal and cerebellar regions of the brain. Surrounding oedema and ring-shaped contrast enhancement were seen lesions.
Results: Finally the patient was diagnosed as MS disease with clinic and radiological findings. Pals- treatment was started at a dose of 1000 mg/kg/day and levetiracetam was ordered 1000 mg/day for seizures, his symptoms improved and the patient was discharged.
Conclusion: MS presenting with seizures as first symptom should be remembered.

p210
Experience in Saudi Arabia of the ketogenic diet at King Fahad Medical City, Riyadh
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Purpose: Few centers in Middle East offer ketogenic diet for epilepsy treatment. Anecdotal data that ratio of the diet needed to reach the state of ketosis might differ in different races. Unpublished data from India claimed that some patients may reach ketosis at ratios of 1:1. Racial differences might play a role.
In KFMC, KSA, the program was initiated in 2008. We evaluated this issue;
Aiming to document differences regarding safety and efficacy of the diet in Saudi patients and those reported internationally.
Method: A retrospective analysis of pediatric epilepsy patients on ketogenic diet since November 2008. 54 patients were included. Ages ranged from 2 months to 11 years. Follow up for at least 6 months.
Results: 54 patients tried on the diet: 6 discontinued (3 no improvement, 1had persistent hypokalemia, 1 developed lipoid pneumonia and 1 for social reasons) Of the 48 patients: 8(17%) became seizure free, 13 (27%) had 90% improvement, 13 (27%) had more than 50% improvement and 6 (12.5%) had no clear improvement.
In 16 (35%) family reported better ambulation.
28 (60%) showed better alertness and became calmer on the diet.
The dose and number of AEDs were decreased, 2 (4%) became off medications.

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38 (88%) got ketotic when the diet ratio was 3:1.
4 (8%) got ketotic only on 4:1. One (2%) had ketosis on 2:1 ratio.
Problems of concern were caused by physicians not knowing the essence of ketogenic diet even in secondary and tertiary hospitals.
Conclusion: Ketogenic diet is a well established tool for difficult to control epilepsy. Results in Saudi Arabia are similar to others. Community and physicians should be well educated about the diet.

p211
Prevalence of complementary and alternative medicines use among pediatric epilepsy patients: a survey of their caregivers
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Purpose: Anecdotal evidence suggests that patients on chronic medication do not disclose use of CAM to healthcare providers in public institutions. Reports of concomitant use of CAM and anticonvulsants in the literature suggest adulteration and interaction can adversely affect patients. This study was conducted to establish how widespread the use of CAM is in paediatric epilepsy patients (PEP).
Method: A single self-administered questionnaire comprising of 27 questions on demographics, epilepsy knowledge and CAM usage was developed. This cross-sectional survey, approved by the Institutional Review Board with participants' informed consent, was for caregivers of PEP. From September 2013 to March 2014, caregivers who accompanied the PEP to the outpatient epilepsy clinic were recruited. Those who declined participation, lacked comprehension of the survey questions or missed the schedule clinic appointments were excluded. Those caring for more than 1 PEP participated only once.
Results: Of the 114 surveys collected, 102 were used for analysis. Twenty-four (23.5%) caregivers reported giving CAM to their PEP. Commonly used CAM were multivitamins (7/24), traditional Chinese medicine (6/24) and acupuncture (4/24) while most frequently cited reasons for its use were caregivers wanted PEP to take a "more natural" treatment (16/24) and they perceived that CAM compared to AED has fewer side effects (15/24). They reported that doctors (9/24), nurses (16/24) and pharmacists (18/24) respectively, did not routinely ask if the PEP used CAM.
Conclusion: While some caregivers gave CAM to their PEP, they were not well-informed about the effects of CAM and were reluctant to disclose this to healthcare providers consulted. It is recommended that healthcare providers routinely probe, document and review the appropriateness of CAM use by their PEP. The caregivers and PEP will benefit from open discussion with the healthcare professionals on epilepsy, the safe use of AED with/out CAM by PEP.

p212
Spectrum of primary sleep disorders misdiagnosed as difficult to control epilepsy: a videopolysomnography EEG (vPSG-EEG) study
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Purpose: Almost 25-30% patients with epilepsy have been found to be 'drug refractory' (DRE), among which possibly only 10-15% are truly refractory. In nearly 5-30% among the rest, i.e. pseudo-refractory patients, misdiagnosis accounts for the refractoriness. There is paucity of literature on patients with primary sleep disorders misdiagnosed as refractory epilepsy. This

retrospective study aims to identify the spectrum of primary sleep disorders confirmed on videopolysomnography-EEG (vPSG-EEG), having been referred as DRE.
Method: Review of tabulated data from our intractable epilepsy clinic and Sleep disorders clinic, was carried out for all consecutive patients referred to, as refractory epilepsy, but who were later confirmed to be suffering from a primary sleep disorder. Patients were included if they had a pre-existing diagnosis of epilepsy, with frequent recurrences of episodes, had been or were still receiving anti-epileptic drugs (AEDs) and had vPSG-EEG confirmation of the diagnosis after evaluation at our center.
Results: Among a total of 909 patients referred for DRE, 31 (mean age 24 + 17 years, 6 females) fulfilled the inclusion criteria. Out of these, 4 had sleep-apnea- associated-movements, 3 had narcolepsy with cataplexy, 4 had REM sleep behavior disorder, 12 had non-REM parasomnias, 4 had violent periodic limb movements, 3 had gastro-esophageal reflux associated stereotyped movements and 3 had rhythmic movement disorder, and 2 had propriospinal myoclonus of sleep initiation. Three patients had more than one sleep disorder mistaken as epilepsy. All patients had been on treatment with at least one antiepileptic drug (AED) for a median duration of 3.5 years (range 0.4 to 20 years), and all patients had remarkable relief after appropriate treatment of their sleep disorder and discontinuation of the AED.
Conclusion: This study details a large series of patients with primary sleep disorders, misdiagnosed as epilepsy, who could be effectively treated following clinical and vPSG-EEG evaluation.

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Clinical research in the private practice setting
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Clinical trials traditionally are conducted within academic institutions (Avitzur A. Neurology Today 2004;4(12):63-64.) yet private practice has been involved in such trials for ≥20 years (Beran RG and Tilley M. Epilepsia 1994;35(1):101-106; Beran RG and Beran ME. Med Law 2006;25(3): 503-512; Fisher JA. PLOS Med 2012;9(7):e1001271.). Routinely, Strategic Health Evaluators runs 10 concurrent trials at any time.
It conducts clinical research in private practice, its team including a neurologist, study coordinator/research assistant, practice manager and administrative staff (Beran RG and Beran ME. Epilepsia 2000;41(7):875-879.). It has been involved in trials since 1988 (Beran RG and Beran ME. Epilepsia 2000;41(7):875-879.) with a standard operating procedures manual, detailing each trial, regularly updated to reflect new studies. Patient records are reviewed and diagnostically coded to provide quality assurance and code patients according to their diagnoses, thereby facilitating searches for eligible patients for studies. It also ensures appropriate "follow-up" and communication with referring physicians.
Review of patient management identified a number of potential, previously unrecognised, adverse events associated with anti-epileptic medications (AEMs), including abnormal behaviour and haematological effects (Beran RG and Gibson RJ. Epilepsia 1997;38(S3):68; Rush JA and Beran RG. Med J Aust 1984;1:426-427; Storrier S and Beran RG. Epilepsy Behav Case Reports 2014;2:15-16.).
Therapeutic Monitoring (TM) of AEM blood levels has fallen out of favour (Krasowski MD. Pharmaceuticals 2010;3:1909-1935.) yet it assisted in treating cluster seizures (Beran RG. J Neurol Neurophysiol 2011;S2:1-2.), identified generic substitution causing adverse effects (Patel V et al. Epilepsy Res 2012;98(2-3):269-272.) and possible interactions with LEV while allowing idiosyncratic patient tailoring of AEM regimen (Stepanova D and Beran RG. Seizure 2014

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(Epub ahead of print 13 Mar 2014).).
This paper describes lessons learnt from clinical research in private practice which helped improve patient care.

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From stigma to narrative: the illness stories of three patients with epilepsy

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Past researches have mainly taken epilepsy stigma theory to analyze the experience of stigma perceived by patients with epilepsy, and furthermore, symbolic interaction theory to explore the impact of self-concept produced by epilepsy. Both theories put emphasis on that patient with epilepsy as the victims of the disease. The illness narrative has been a focus of research to listen to the voice of patients and to show how they give meaning to illness.Basing on subjective experience of patients with epilepsy, this study uses narrative analysis to explore how they describe events and happenings that occur in daily life, and interpret those changes and disruptions that epilepsy produced.
Three participants joined this study, including one male patient, one female patient´s mother, and one female patient. The history of epilepsy is from five to 19 years. All of them coexist with epilepsy in different ways, and present different narrative styles of self-significance.Three participants have produced stigma image in the first coming of epilepsy seizures. The first patient with 19-year illness trajectory presents the typical characteristics that stigma theory and symbolic interaction theory describes, including stigmation, loss of self and severe social isolation. The second patient with 6-year of illness trajectory, after the positive reconstruction of the triple relationships of family, school and social, she and her family overcome the epilepsy stigma, and create a new project of self. The third patient has 5-year epileptic career that successfully examines and evaluates the significance of epilepsy in her journey of personal growth, and present the positive self all the time. Three participants show different self-reflexive program. By illness narrative, patient´s self-positioning and the way of reconstruction of life world can be understood, that is benefit for health care, social work and counseling.

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Abatement of epileptic spike-wave discharges in an epileptic neural population model

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Purpose: Spike Wave Discharges (SWD) are the commonly observed electrographic seizure waveform morphology which is frequently associated with absence seizures, myoclonic seizures and complex partial seizures. Brain stimulation via electrodes has been suggested as an alternative therapeutic treatment for epilepsy for those patients in which pharmacological therapy for epilepsy is not sufficient.
Method: In this study, we present a macroscopic neural population model of SWD which enables the analysis and prediction of the system behaviour. The seizure abatement was formulated as an optimal control problem which was solved using the pseudospectral method.
Results: Using this method we show stimuli solutions that eliminate the pathological spike wave discharge seizure behaviour in the presented model. We develop a realistic simulation of

seizure abatement and we employ a moving window controller which monitors the system state in real-time. When a seizure is detected the control is triggered which drives the state to the stable equilibrium, thereby stopping the seizure.
Conclusion: This work provides a large step forward in developing methods which can be used to derive stimuli for neuroscience applications. We aim to expand the proof-of-concept in this study to address the spatially extended models.

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Medication problems identified by parents of patients with epilepsy and developmental disabilities, a qualitative study
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Purpose: Medical treatment is considered complete only when medication prescribed by the doctor is taken by the patients. Patients with epilepsy and global developmental disabilities might face more challenges in administering and maintaining the medication use. This study aimed to investigate problems encountered by parents taking care of patients with epilepsy and global developmental disabilities in the long term administration of medication.
Method: Fourteen parents whose children suffered from epilepsy and developmental disabilities were interviewed using open-ended questionnaire and were audio recorded. Transcribed verbatim was analysed using interpretative phenomenological analysis.
Results: The analysis revealed seven main themes: *Availability and accessibility, affordability, adventurous administration, adherence, attaining drug efficacy, adverse drug reaction and anxiety.* Medication prescribed was not available and affordable to some patients. Collecting repeat medication from the pharmacy was a challenge when parents have to look after their children and work full time. Disabilities are an obstacle to medication administration, for example, patients with dysphagia may not be able to swallow medication in tablet form only. Devices such as pill cutter and crusher useful for modifying medication to a more suitable dosage form, was not available to the parents. Adjustment of dose was also a challenge because a small group of parents were worried about the adverse drug reaction, hence intentionally reduce or even omit the doses. Some patients themselves chose not to take the medication and this made supervising and ensuring medication taking by patients difficult. Misconception towards medication due to poor medication knowledge and previous encountered with adverse drug reaction deterred parents from trying out new medication.
Conclusion: This study provided understanding of the challenges in medicating patients with epilepsy and developmental disabilities. With better understanding, the healthcare teams will be able to provide better treatment and care for them.

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Detection and measurement of drug noncompliance in patients with epilepsy: study of causative factors in 100 patients
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Purpose: Noncompliance in patients with epilepsy is a serious barrier to successful treatment .Non compliance in epileptic patients is complicated & multidimensional attribute .The purpose

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of study was to identify factors responsible for noncompliance
Method: 100 patients of epilepsy in OPD setting includes 56M,44F, Patients were categorized in 4 age groups, Gr1(6-12 yrs) Gr 2(13-20 yrs)Gr3(21-40 yrs)Gr4>than 40yrs.Two subgroups of sample set includes rural & urban. Method for assessment of compliance was patients interviews through structured questionnaire including 15 variables:- 1)Other illness 2) missed dose 3)ignorance 4)religious reasons 5)lack of seizure control 6)AED unaffordability 7)Sudden change to Ayurvedic treatment 8) denial of illness 9)lack of knowledge 10)irritation 11)adverse effect 12)limited stock of medicines 13) marriage issues 14)unavailability of medicines 15)treatment regime. AED drug level estimation was done in majority with older AED'S which is helpful in confirming poor compliance..Economic evaluation data of direct cost of Anti epileptic drug was calculated100 patients .Anova single factor method for statistical analysis was applied to determine the compliance against age groups,gender, duration of epilepsy,etiology of epilepsy place of origin, size of family & drug cost & 15 variables.
Results: Urban population had better compliance 63.4% as compared to rural 36.5% (p=0.00005) with highest compliance in children(age group1) 85% p=0.002 & lowest compliance was found in elderly adults at only 27% p=0.0112.There was no association between noncompliance for gender or family size.Drug cost was found to be directly correlating with noncompliance of 52%(p< 0.01)
Conclusion: Drug compliance is satisfactory in50% of patients according to their self report. The poor compliance was confirmed by drug monitoring. in 50 % patients did not adhere to the treatment due to personal judgment .Urban population more inclined to compliance p=0.00005. Age & drug cost due to complex regime have direct correlation to noncompliance. To improve & ensure compliance of epileptic patients paying attention to medical education for patients through written information is important and useful.

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Ketogenic diet can be improved with a high polyunsaturated fatty acid content
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Purpose: The ketogenic diet (KD) is used to treat persons with uncontrolled epilepsy. One proposed mechanism of KD is the elevation of polyunsaturated fats (PUFA) resulting in increased resistance to seizures in ketotic brain tissue. The PUFA-enriched KD may achieve a greater level of ketosis than a traditional KD .
We hypothesized that a PUFA enriched KD would help attain a greater degree of seizure control as compared to mixed fats KD (MFKD).
Method: This was a prospective open, non-blinded study of 29patients of age 11 months to 16 yrs (mean= 7yrs) who had inadequate seizure control on MFKD. They were changed to high PUFA KD. MFKD consists of 32.1% PUFA while PUFAKD consists of 73% PUFA. PUFA was used in a ratio of N3:N6 of 1:2.8.
Results: Responder rate (more than 50% reduction in seizures) was 16 out of 29 (55.17%). Six showed an increase in seizures initially but later improved (20.68%
Seven did not show improvement (24.13%).
Conclusion: PUFA KD could be tried in those who fail classical MFKD. Out of the four trials to date in one 5 out of 21 had a greater than 50% reduction in seizures while in three there was no change. A randomized control trial of PUFAKD against MFKD would help to decide whether PUFAKD should be used routinely in preference to MFKD.
Other studies gave lesser or no improvement. This is probably because the period was too short or the amount of PUFA was inadequate.

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Experimental study on therapeutic effects of vagus nerve stimulation for epilepsy

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Purpose: To improve the therapeutic effects and the making of VNS system by study the correlativity between the parameters of VNS and the frequency of epileptic discharge.
Method: Improved epilepsy model by injected 0.1% KA 5~10μl into the brain cortex of rabbit. Implanted the VNS system, which made in China, into the rabbit. Analyzed and evaluated the V-EEG of the epilepsy rabbit which treated with different parameter VNS.
Results: The EEG frequency of normal rabbit was 14~18Hz, and the amplitude voltage is 20~50 mv. The epileptic discharge could be recorded after KA injection 30 minutes later. The frequency was 2~30 Hz. Different VNS parameters of treatment had varied different results in different frequency epileptic discharge. Lower frequency VNS had a better result to lower frequency discharge, and the same as higher frequency VNS to higher frequency discharge.
Conclusion: There were some pertinency between the parameters of VNS and the frequency of epileptic discharge. These results had directed significance to the choice of VNS parameters in clinical and the developing of new VNS device.

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Utility of EEG in diagnosis of epileptic and non epileptic seizures at Cipto Mangunkusumo Hospital, Jakarta, Indonesia

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Purpose: To describe utility of EEG examination in EEG lab, Cipto Mangunkusumo Hospital, Jakarta Indonesia during 2013.
Method: It was retrospective descriptive study. Medical record of patients that had been performed routine EEG examination at EEG lab Cipto Mangunkusumo Hospital during 2013 (January-December 2013) was reviewed.
Results: There were 241 patients that had been performed EEG examination during 2013. Patients were referred from inpatient ward, outpatient clinic, emergency room and other hospitals. The range of age was 2-82 years old. The most frequent clinical referral diagnosis was focal seizures (Simple Partial Seizure, Complex Partial Seizure, Secondary Generalized Seizure) that were 51.4%. However, some patients were referred with clinical diagnosis other than seizure (syncope 9.1%, headache 6.6%, others 1.7%). During EEG examination, most of patients had awake and sleep state (61%); sleep state could not be achieved in 39% patients.
Abnormal EEG was found in 49% patients which 41.1% patients with focal seizures. The most frequent abnormality pattern was focal epileptic discharges. Temporal was the most frequent epileptic focus and followed by frontal (55.6% and 24.6% respectively). Among 34 generalized seizure patients, focal epileptic discharge was found in 15 patients. Meanwhile, generalized epileptic discharge was found in 1 out of 32 patients with secondary generalized seizure. Acute symptomatic seizure mostly showed abnormal EEG (12 of 21 patients). Patient with syncope mostly showed normal EEG (18 of 22 patients). Only 1 of 16 patients with headache that showed focal epileptic discharge and apparently this patient become secondary generalized seizure 2 months after the EEG examination.
Conclusion: The most frequent clinical referral diagnosis was focal seizures. Abnormal EEG was

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found in 49% which 41.1% in focal seizures patients. Temporal is the most frequent epileptic focus. Most patient that referred with syncope and headache showed normal EEG.

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Bringing people with epilepsy closer to treatment in low and middle income countries (LMICS) -- time to get inspired by local initiatives

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Background: Epilepsy is a major neurological disorder. Safe and effective treatment is available since several decades. Yet, most people with epilepsy (PWE) do not have adequate access to diagnosis, appropriate treatment and structured therapeutic follow-up, particularly in low- and middle-income countries (LMIC). Local initiatives to improve access to care of PWE exist. It is therefore worthwhile to identify "experience and evidence based approaches" from LMICs that would otherwise not become visible to the international community.

Methods: Institut d'Epidémiologie et de Neurologie Tropicale (Limoges, France) alongwith its decade-long partner- Sanofi's Access to Medicines Department, convened 39 experts from 20 LMIC and developed countries. A problem-based approach i.e. similar to the one adopted in a problem-based learning, was used in which all experts divided in three groups were given one task: to identify three "levers" that could help epilepsy patients in consulting their healthcare professionals. This identification of levers was to be based on the review of real-life "local initiatives" being conducted in various LMICs.

Results: The three "levers" identified were: creation/development of patients associations (self-help movements); increased awareness & understanding among stakeholders; bridging

with traditional & faith healers. Several real-life examples of how PWE are helped to consult healthcare professionals in Asia, Africa and Latin America were also identified, including epilepsy clinics led by clinical (non-doctor) officers through Kenyan Association for the Welfare of people with Epilepsy in Kenya; countryside doctors group through Santé Sud in Mali; Caravan Bus in Senegal; domestic health visiting and microfranchising in Laos and Cambodia; reduction of epilepsy burden through prevention in Ecuador; large scale sensitization and education on epilepsy in Madagascar.

Conclusions: The meeting recognises that challenges to improve access of care to PWE in LMIC is tremendous which a many underlying factors disfavouring effective access. However, the following key issues were identified: (i) Bridging with faith healers, (ii) developing self-help movements, and (iii) increasing awareness & understanding among various stakeholders (health system improvement). Moreover, the meeting demonstrated that inspiration can be taken from number of "real-life" innovative methods that are being used in number of LMICs to help PWE consult their healthcare professionals.

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Serum concentrations of MMP-9, TIMP-1, and neurofilament in children with prolonged febrile seizures

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Purpose: Matrix metalloproteinase-9 (MMP-9) is a member of this family that degrades collagen IV, a major component of the basement membrane of the cerebral epithelium that is also responsible for the integrity of the blood-brain-barrier (BBB). The activity of MMPs is further controlled by tissue inhibitors of matrix metalloproteinase (TIMPs), and one such inhibitor, TIMP-1, has high avidity for MMP-9. The balance of MMP-9 and TIMP-1 plays an important role in the function of BBB. Neurofilament (NF) is a major cytoskeletal protein of neurons. Elevation of serum NF concentration suggests neuronal injury, especially damage to axons. We investigated the function of the BBB by MMP-9 and TIMP-1, and assessed neuronal damage by using phosphorylated form of NF-heavy chain (pNF-H) in children with febrile seizure (FS).

Method: We used enzyme-linked immunosorbent assay to measure serum levels of MMP-9, TIMP-1, and pNF-H in 42 children with FS and 28 controls.

Results: Serum MMP-9 levels in children with prolonged FS (PFS) were significantly higher than those in simple FS (SFS) and controls ($p=0.033$, and $p< 0.001$, respectively). There were no significant differences of serum TIMP-1 levels among children with PFS, SFS, and controls. MMP-9/TIMP-1 ratios in children with PFS were significantly higher than those in controls ($p< 0.001$). Serum pNF-H levels in children with PFS were significantly higher than those in SFS and the controls ($p=0.024$, and $p< 0.001$, respectively). There were no significant differences in serum pNF-H levels between children with SFS and the controls. There was a significant correlation between seizure duration and serum pNF-H levels during the first week in children with FS ($p=0.022$).

Conclusion: Our results suggest that PFS could induce the dysfunction of the BBB and lead to some degree of neuronal damage even in the absence of abnormal clinical neurological findings during the short-term follow up period.

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Epilepsy with myoclonic absences: clinico-electroencephalographic-imaging characteristics and long term outcome - our experience from comprehensive epilepsy care centre in Southern India

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Purpose: To study clinico-electroencephalographic-imaging characteristics and long-term outcome of patients with epilepsy with myoclonic absences (EMA).

Method: In retrospective-cohort study, we reviewed computer-database maintained clinical records of EMA patients who attended epilepsy centre of our institute. Each patient's demographic data, birth/developmental history, seizure semiology/pattern, antiepileptic drugs (AEDs), clinical examination, video-electroencephalography (VEEG) and neuroimaging data were reviewed. Response to AEDs and change in seizure frequency/pattern on follow-up were noted. Responder was defined as >50% reduction in seizure frequency on follow-up.

Result: During study period (2009-2013), 12 children was diagnosed as EMA [50% male, mean age at epilepsy onset 3.5 years (range, 0.75-8 years)]. 50% patients had developmental delay and 66% had behavioral problems. Main seizure types were characteristic myoclonic absence (100%) and generalized tonic-clonic seizures (42%). Ictal correlate on VEEG was 3-3.5Hz spikes-and-wave discharges (82%) and fast recruiting bifrontal rhythm (25%). One patient had abnormal MRI (occipital white-matter hyperintensity). Karyotyping was normal in all patients. Drugs tried before first evaluation were valproate-100%, levetiracetam-75%, clobazam-50%, clonazepam-41% and lamotrigine-41%. Ten patients had at-least one follow-up visits; mean duration of follow-up was 23.9 months (range, 4-63 months). Compared to baseline, seizure frequency had significantly improved on follow-up (p=0.005), and at last follow-up, nine-90% patients were in responder group: four-45% seizure-free, two-22% with >90% and three-33% with >50% reduction in seizure frequency. AEDs numbers were significantly lesser at last follow-up among responders (2.55 vs. 1.77, p=0.02) vs. non-responders (3 vs. 3). Two patients on follow-up developed different seizure pattern, tonic or complex partial seizures.

Conclusion: This cohort, one of the largest on EMA, reveals heterogeneity of seemingly homogenous electroclinical phenotype. Clinical semiology while unique may demonstrate focality and variable ictal patterns. Most patients respond with either valproate monotherapy or valproate-lamotrigine combination. Fewer patients remain drug refractory and may evolve into tonic or complex partial seizures.

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Two cases of deletion syndrome with epilepsy confirmed by array-CGH

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Purpose: Pediatric epilepsy can be caused by various conditions including specific syndromes. It is beneficial to know the specific causes of epilepsy for understanding the pathogenesis and prognosis as well as management.

Method: Here are two cases of deletion syndrome confirmed by array-CGH and FISH analysis.

Results: Patient 1 was transferred for the evaluation of heart murmur at 9 days of life. During follow-up, he showed poor weight gain and short stature with microcephaly. He also presented remarkable hypotonia together with characteristic craniofacial dysmorphism including deep-set

eyes, small low-set ears, flat nasal bridge, and dark straight eyebrows. Brain MRI done showed brain atrophy with mild ventriculomegaly and arachnoid cyst. He has had recurrent febrile seizures since 12 months of age and developed afebrile seizure at 5-year-and-3-month old. The interictal EEG showed moderate abnormality with intermittent bifrontal sharp waves which were sometimes generalized. The conventional chromosomal study did not show any abnormality, but array-CGH analysis revealed 9.15 Mb copy loss (1p36.33-36.22), suggesting 1p36 deletion syndrome. The FISH analysis confirmed the diagnosis.
Patient 2 was brought to the hospital due to seizure at the age of 14 month. She was born with gestational age of 39 weeks, birth weight of 2.1kg. Initial brain MRI done at 9 months of age showed diffuse brain atrophy, and the follow up MRI done at 4-year-9-month of age showed aggravated brain atrophy more prominent in the left hemisphere. Now, she is 6 year old, but she can only roll over and is unable to speak a meaningful word. The conventional chromosomal study did not show any specific abnormality, but array-CGH analysis revealed 1q44 deletion syndrome with 3.9 Mb copy loss.
Conclusion: It would be very useful to consider array-CGH analysis for the evaluation of the patient with epilepsy and severe global developmental delay.

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Neonatal seizures and childhood epilepsy in rural Bangladesh
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Purpose: To characterise the profile of neonatal seizures and childhood epilepsy in a rural Bangladeshi setting.
Method: Neurological assessment was undertaken in the inpatient and outpatient setting of a busy rural Bangladeshi hospital. Seizure semiology and neurodevelopment were documented. Phone video footage (n=32) and EEG (n=40) were obtained for clarification. Commonly presenting seizure mimics were identified.
Results: Seizures were characterised in 25 neonates (age less than one month): tonic esotropia in severe HIE (n=6); focal seizures without consistent lateralisation due to hypocalcaemia / HIE / both (n=10); focal seizures with consistent lateralisation and hemiparesis (n=2); isolated focal seizure due to hypoglycaemia (n=2); seizures with bilateral clonic jerking in kernicterus (n=2) and multifocal myoclonia due to HIE / other presumed metabolic cause (n=3). Excluded non-epileptic mimics in neonates were jitteriness (n=3), hypocalcaemic or infectious tetany (n=4), and bicycling or extensor posturing due to either HIE or kernicterus (n=6).
Epilepsy was characterised in 164 children (age one month to 16 years). Epilepsy syndromes with normal neurodevelopment were: focal seizures with occipital and Rolandic features (21.3%); convulsive generalised epilepsy without hyperventilation-induced absence (4.3%); absence status (0.6%); other epilepsy without unequivocal focal/generalised features (5.5%). Epilepsy syndromes with clearly abnormal neurodevelopment were: symptomatic focal epilepsy (SFE-58.5%); epileptic spasms (5.5%) other symptomatic generalised epilepsy (4.3%). Febrile convulsions were excluded from the cohort. Associated findings in the SFE group were: microcephaly (< minus 3 standard deviations) 52%, severe intellectual disability 68% and abnormal sensorimotor examination 94%. Persistence of primitive reflexes (n=22), irritability reaction (n=18), and ankle clonus (n=6) commonly presented but were also excluded from the cohort.
Conclusion: HIE and hypocalcaemia remain important management priorities in neonatal seizures. Symptomatic focal epilepsy with clearly abnormal neurodevelopment and microcephaly has a high prevalence in rural Bangladesh. Parents frequently construe abnormalities in tone and persisting primitive reflexes as epilepsy.

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Reduced serum PON1 activity and oxidative stress in children with intractable epilepsy

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Purpose: Reduced serum PON1 activity, an antioxidant enzyme that had paraoxonase, arylesterase, and dyazoxonase activities, is related to increased susceptibility to low density lipoprotein oxidation and development of atherosclerosis. The aim of this study was to investigate PON1 activities along with oxidative status parameters in children with intractable epilepsy.

Method: Forty-two patients with intractable epilepsy and 35 age and sex matched healthy controls were enrolled in the study. Serum paraoxonase, arylesterase activities, and lipid hydroperoxide (LOOH) levels were determined.

Results: Paraoxonase and arylesterase activities were significantly lower in patients with intractable epilepsy than controls ($P< 0.001$, and $P< 0.001$ respectively) whereas LOOH levels were significantly higher ($P< 0.05$).

Conclusion: Reduced serum paraoxonase activity and elevated LOOH levels of intractable epilepsy subjects may suggest increased lipid peroxidation and oxidative stress in these patients. Moreover, intractable epilepsy subjects may be more prone to development of atherogenesis due to low serum paraoxonase/arylesterase activity.

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MicroRNA-204 regulates neurons apoptosis after recurrent seizures via upregulating SIRT1 expression

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Purpose: Seizures, a common developmental central nervous system disease, is known to be associated with the dysfunction of neurons, astrocytes and other brain cells. Although the mechanisms in this process remained unclear, specific microRNAs might participate in the event of neurons apoptosis which plays a vital part in the event of seizures. The main objective of the current experiment is to investigate whether miR-204 is involved in regulating neurons apoptosis after seizures.

Method and Results: We used qRT-PCR to detect the expression of miR-204 in hippocampus after developmental seizures and PC12 cells after KA treatment, and results showed that seizures enhanced the levels of miR-204 in vivo and vitro, whereas the expression of SIRT1 protein were decreased significantly in PC12 cells after KA-induced seizures, and p53 protein level were elevated in cells after KA incubation compared with the control group. TUNEL arrays shows that developmental seizures induced significantly apoptosis of neurons in hippocampus, and KA treatment resulted to PC12 cells apoptosis in a dose-dependent manner. Overexpression of miR-204 by transfection of miR-204 mimics obviously decreased SIRT1 protein and accelerated PC12 cells apoptosis, while miR-204 inhibition by transfection of miR-204 inhibitors led to enhanced SIRT1 protein and alleviated PC12 cells apoptosis, indicating miR-204 might act as an essential attenuator of SIRT1 in neurons apoptosis. This process might be mediated by the attenuation of the expression of p53 protein, which were abolished by the transfection of SIRT1 siRNA in vitro.

Conclusion: Our present study has revealed that attenuation of miR-204 might contribute to neurons apoptosis after seizures through downregulating the expression levels of p53 and ace-p53 in a SIRT1-dependent manner. Our experiment represents miR-204 as an essential negative regulator of neurons apoptosis and provides a potential therapeutic target for recurrent seizures.

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Experience with the International League Against Epilepsy classifications of epileptic seizures (1981) and epilepsies and epileptic syndrome (1989) in epileptic infants and children in a developing country

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Purpose: To study the clinical profile of seizures in pediatric age group and attempts to classify seizures into specific sub-types/syndromes as far as practical.

Method: This is a prospective study starting from October 2011 to June 2013. All children with seizures between 1 month to 12 years of age were subjected to detailed history, examination, EEG and neuroimaging and were classified as per the 1981/1989 ILAE classification.

Results: A total of 200 children were evaluated for seizures with 114 (57%) males and 86 (43%) females. The etiology was regarded to be symptomatic in 56.5%, idiopathic in 14% and cryptogenic in 29.5% of the children. Generalized tonic-clonic seizures were the most common seizure type (31.5%).Progressive myoclonic epilepsy occurred in 9.5% cases, Lennox-Gestaut Syndrome in 7%, West syndrome in 4.5% and childhood absence epilepsy in 3.5% cases. Febrile convulsions (5%) were most common situation related seizures. CNS infections (23%) and birth related trauma (15%) were most common etiologies. Almost all children were on antiepileptic treatment, 71% were on monotherapy. Of the patients with uncontrolled seizures, 70% had symptomatic seizures.

Conclusion: In our study CNS infections and birth trauma represent the main causes. Progressive myoclonic epilepsy formed a large proportion of patients though this epilepsy syndrome does not find proper place in the classification.

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Presumed genetic epilepsy, hemiconvulsion-hemiplegia-epilepsy syndrome and hemispherotomy

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Purpose: To describe the epilepsy evolution and response to surgery in a child with presumed genetic epilepsy and hemiconvulsion-hemiplegia-epilepsy (HHE) syndrome

Method: Retrospective review of clinical, electroencephalography, neuroimaging and seizure outcome

Results: A girl with strong family history of epilepsy (father, sister, uncle and two cousins affected) developed infrequent nocturnal convulsive seizures at age 3 years 4 months, associated with normal interictal EEG. Focal seizures with staring and right hemi-tonic/clonic features appeared at age 4 years, when EEG showed left temporo-parietal discharges and brain MRI was normal. Recurrent bouts of prolonged right hemiconvulsive seizures, often precipitated by febrile illness, subsequently ensued, resulting in a lasting right hemiparesis and left cerebral atrophy on MRI at age 5 years. Asymmetric tonic seizures and bilateral/ generalised EEG abnormalities predominated from age 8 years and were refractory

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to multiple anti-epileptic drugs. MRI at age 11 years revealed further left cortical destruction/ atrophy (especially over motor/ perisylvian regions), ipsilateral hippocampal sclerosis and preserved right hemisphere. Ictal EEG during tonic seizures and FDG-PET hypometabolism were lateralised to the left, supporting the decision to perform a left peri-insular functional hemispherotomy at age 12 years. Several clusters of tonic seizures with prominent right hemisphere ictal rhythms and interictal discharges occurred during the acute post-operative period but ceased three weeks post-surgery. Overnight video-EEG monitoring at 6 and 12 weeks post-surgery showed progressive reduction of right hemisphere spike-waves and relatively mild left hemisphere abnormalities. SCN1A gene analysis revealed a missense mutation at Exon 10 c.1499 G>A (p.Arg500Gln), not predicted to be pathogenic.
Conclusion: Hemiconvulsion-hemiplegia-epilepsy (HHE) syndrome may rarely affect patients with familial, presumably genetic epilepsy. Functional hemispherotomy may be effective in selected patients with HHE syndrome even in the presence of generalised seizures and EEG abnormalities.

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Redesign care process to improve quality of care for epilepsy patients using an Epilepsy Action Plan (EAP)
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Purpose: Epilepsy and seizures cause stress to caregivers and patients, especially at seizure onset and diagnosis. Unstructured epilepsy counselling has poor caregiver knowledge retention, repeated epilepsy/seizure management-related enquires, unnecessary emergency and ad hoc clinic visits and hospitalization. Accurate information and counseling at the point of diagnosis promotes coping and long-term adjustment skills and reduces misconceptions.
We implemented a standardized epilepsy counselling tool, the Epilepsy Action Plan (EAP), to increase caregiver knowledge on epilepsy and seizure management and promote Patient-Centered Care (empowerment).
Method: We implemented the EAP with standardized counselling points, step-wise instructions and coloured pictorial guide. A knowledge questionnaire was administered verbally to 35 caregivers of paediatric patients with newly diagnosed epilepsy, before and 2 weeks after implementing the Epilepsy Action Plan. A satisfaction questionnaire comprising of a 4-point Likert scale and feedbacks on the EAP was conducted on a total of 36 non-neurology healthcare workers (doctors, nurses and pharmacists) and the recruited caregivers.
Results: Caregiver knowledge score improved by 12% ($P < 0.001$) following administration of the EAP. Patients who received the EAP at diagnosis maintained zero calls to hospital for seizure first aid/ management. Caregivers who did not receive the EAP during the same period made seizure first aid/management queries constituting 14 % of all enquiries.Patients with EAP also maintained zero attendances to emergency, admissions and ad hoc clinic visits compared to 28.6 % of patients without EAP.Non-neurology healthcare workers all agreed or strongly agreed that EAP serves as an educational tool for health professionals and standardizes the format for epilepsy counselling and seizure management.Likewise, 100% of caregivers strongly agreed that EAP is useful, informative, clearly written and aided in knowledge retention.
Conclusion: The Epilepsy Action Plan is a useful tool that is well received amongst both caregivers and health professionals and had significant impact on caregivers' epilepsy knowledge retention.

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Nephrolithiasis in paediatric patients taking long-term topiramate

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Purpose: To evaluate the incidence of nephrolithiasis in paediatric patients on topiramate:

Method: In this retrospective observational study, we reviewed the medical records of all patients treated with topiramate for epilepsy seen at Department of Paediatrics, Prince of Wales Hospital, HKSAR from Jan 2005 to Dec, 2013. Their ambulatory status, age at commencement of treatment, treatment duration and renal ultrasound findings were recorded.

Results: Medical records of 82 patients were reviewed. Their age ranged from 3 months to 17.6 years old (median 6.7 years old). 49 patients were male (59.7%). 33 patients were non ambulatory (38%). The average duration of topiramate use was 3.23 years (median: 1.5 years). None of the patients reported to have clinical symptoms related to nephrolithiasis. Among 44 patients using topiramate for more than 12 months, 28 patients underwent renal ultrasound screening. One was found to have small asymptomatic urinary stone and the other had suspicious soft stone in renal ultrasound, which resolved on subsequent scans. Both of them were non-ambulatory and the latter was also on ketogenic diet.

Conclusion: The role and timing of routine renal ultrasound surveillance in topiramate users still remain controversial. We suggest selective screening for symptomatic or patients with added risk factors, including non-ambulatory status, patients on ketogenic diet or other carbonic anhydrase inhibitors, etc.

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Quality of life of Thai children with benign rolandic epilepsy

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Purpose: Benign rolandic epilepsy is the most common epilepsy syndrome in childhood. Benign rolandic epilepsy is not totally benign in its impact on patient and family. Some studies found higher incidence of reduction of participate in social activities, quality of life and academic difficulties. However there is no study of quality of life of children with benign rolandic epilepsy in Thailand. The associated learning disabilities or cognitive impairment may affect the quality of life of Thai children with benign rolandic epilepsy.

The objectives of this study are:

1. To determine the quality of life of Thai children with benign rolandic epilepsy.
2. To explore the factors influencing the quality of life.

Method: Thai version health-related quality of life questionnaire was sent to the patients, aged between 6-18 years and diagnosed with well defined clinical and electrophysiological features of benign rolandic epilepsy (ILAE criteria, 2006) in Ramathibodi Hospital from 2002-2011.

Results: Fifty-one patients were recruited (25 female and 26 male).The average age was 12 years. The mean duration of epilepsy was 3.5 ± 2.2 years. Most (76%) of the patients had no recurrent seizures over the last year of follow up. The quality of life of children with benign rolandic epilepsy was slightly impaired, especially in general health, memory and concentration. The solely factor determining overall quality of life was duration following the last seizure.Other factors determining some parts of quality of life; parental anxietytended to affect to school activity and underlying disease tended to affect to memory and concentration. There is no statistically significant association between IQ scores/WRAT scores and quality of life.

Conclusion: The quality of life of children with benign rolandic epilepsy was mildly impaired.

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Duration following the last seizure, parental anxiety and underlying disease may be the important determining factors.

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Reduction of carbamazepine-related allergic skin reactions through HLA genotype screening

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Purpose: In the medication of anti-epileptic drug (AED), Steven-Johnson syndrome(SJS) and toxic epidermal necrolysis (TEN) are the most serious though uncommon side effects, which bother most practitioners and patients. Previous studies have suggested that pre-medication screening of HLA-B*1502 helps to prevent the occurrence of SJS-TEN in Asian countries including Thailand, Malaysia, India, and Taiwan before the use of carbamazepine (CBZ). We further seek to find whether the screening can reduce the incidence of all drug-related skin allergies before the medication of CBZ.

Method: From 2010 to 2013,we screened the purified DNA for testing the presence of HLA-B*1502 allele for all patients before the use of CBZ. Those without the HLA-B*1502 allele were prescribed with CBZ while those with the allele not. We then followed up these patients taking CBZ the presence of skin rash in the OPD. We also used the historical incidence of CBZ-induced SJS-TEN and skin rash through the National Health Insurance Research Database(NHIRD) in 2002 as a control group.

Results: Of the total 66 recruited patients, 59 out of 66(89.4% of the total) are HLA-B*1502 negative, while 7(10.6%) patients are positive. Among the HLA-negative ones, 5/59 patients (6.7%) developed drug-related skin rashes after the medication with CBZ. No SJS-TEN was noted in both groups. The baseline ratio of SJS-TEN out of patients taken CBZ from NHIRD is 0.23 %(123/50917), while the ratio of skin rash is 2.83 %(1441/50917).

Conclusion: The screening of HLA-B*1502 can remarkably reduce the incidence of carbamazepine- induced SJS-TEN, yet minimally reduces the incidence of CBZ-related allergic skin rashes. The screening with negative genomic result cannot preclude the risk of any skin allergy, but do prevent the occurrence of severe allergic reactions such as SJS or TEN.

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Hemorrhagic stroke and developed symptomatic epilepsy in children

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Purpose: To examine time of occurrence and type of epileptic seizures in children who has underlying hemorrhagic stroke.

Method: We are examined 150 children from birth to 14 years who has stroke. All of the patients conducted MRI, EEG studies.

Results: Symptomatic epilepsy clinically has different types of seizures. During acute period of hemorrhagic stroke seizures appear in 60% (90 patients).

Type of seizures: mainly partial 32.3 % cases (20 patients), with secondary generalization 21% cases (13 patients), among generalized seizures dominantly with tonic convulsions 21% (13 children). Attacks like absence were observed in 3,2% cases (2 children); with severe myoclonic seizures 16.1 % (10 children) cases. In acute period of stroke 46% (30 patients) has a seizures. Late onset in 21,5 % (14 patients).

Conclusion: Development of symptomatic epilepsy in cases of hemorrhagic stroke creates additional difficulties during the whole stroke, in the selection of treatment and reduce the

patient´s rehabilitation potential.

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Rate and risk indicators of bacterial meningitis among children 3-18 months of age with first febrile seizure following the Child Neurology Society Philippines - Philippine Pediatric Society clinical practice guideline on lumbar puncture

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Purpose: To determine the rate and risk indicators of bacterial meningitis among children 3-18 months of age with first febrile seizure following the Child Neurology Society Philippines-Philippine Pediatric Society (CNSP-PPS) Clinical Practice Guideline (CPG) on lumbar puncture.
Method: This is a cross sectional study of children presenting with first febrile seizure. Medical records were retrospectively reviewed and analyzed
Results: A total of 870 patients aged 3 - 18 months had their first febrile seizure. Five hundred and fifty two had simple febrile seizures while 318 had complex febrile seizures. Compliance to the CNSP - PPS CPG is 96%. The overall lumbar puncture performance rate is 90% in complex febrile seizure group, and 86% in simple febrile seizure group. Among those who had lumbar puncture 25 of 726 or 3% had confirmed bacterial meningitis and an additional 4 patients (< 1%) had suspected bacterial meningitis. Majority (65%) of those with bacterial meningitis belonged to the 6-12 months age and 28% were beyond 12 months. The type of seizure as well as subtle clinical signs such as sleep disturbance, irritability, vomiting, decreased appetite, poor activity, rashes and the presence of ear discharge were not risk indicators for bacterial meningitis. Moderate malnutrition and depressed sensorium are 5 and 10 times more prevalent among those who had bacterial meningitis, respectively.
Conclusion: The prevalence of bacterial meningitis in our cohort is low despite the lack of administration of meningitis-preventable vaccines. Although bacterial meningitis was common in the 6-12 months age group, still a considerable number of patients were beyond 12 months of age. Depressed sensorium and moderate malnutrition are the significant risk indicators for bacterial meningitis. The compliance to the CNSP-PPS CPG recommendation on lumbar puncture for children with a first febrile seizure is high.

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Paroxysmal non-epileptic events in infants and toddlers: a semiology study

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Purpose: Paroxysmal non-epileptic events are frequently encountered in pediatric population. We report our experience with PNEEs in a group of infants and toddlers and analysis the clinical characteristic of the events.
Method: Retrospectively reviewed all video EEG (VEEG) studies performed from January 2010 to April 2011. We included in the study consecutive patients 2 years old or younger who had non-epileptic events recorded. Semiological analysis included: type of event, time of occurrence, clear onset and end, etc.
Results: Out of 81 patients 31 (38.3%) had non-epileptic events, 12 girls and 19 boys (P>0.05). Three had both epileptic and non-epileptic seizures and 28 had only non-epileptic events. Six had abnormal interictal EEG. Eight had family history of epilepsy (25.8%). Ten were developmental delay, and eleven had neurological abnormalities. Events occurred during wakefulness in

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16 (51.6%, P< 0.05); during sleep in 7 (22.6%); in both awake and sleep in 7 (22.6%). On semiology, 20 had behavioral features (64.5%), 10 with arrest of activity, 8 with staring, 6 with crying and 5 with vocalization. 23 had motor features (74.2%) and 9 had autonomic features (29.0%). Events classification: 8 staring spell (25.8%), 7 normal infantile behavior (22.6%), 7 sleep myoclonus (22.6%), 4 shuddering attacks (12.9%), 4 infantile masturbation (12.9%), one tic, one choreoathetosis, one hyperekplexia, one gastro-esophageal reflux and one episode of discomfort. **Conclusion**: Paroxysmal non-epileptic events are very common in infants and toddlers. Males were more than female in the study group. Non-epileptic staring spell is the most common PNEEs seen in this age group.

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Study about rolandic epilepsy

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Purpose: Rolandic Epilepsy is the most common idiopathic partial epilepsy in childhood with excellent prognosis. Age of onset is 3-13 yrs. Seizure semiology is characterized by brief hemifacial seizures becoming generalized typically during sleep or simple partial seizure with unilateral paresthesia, tonic clonic seizures, speech arrest, and inability to swallow with drooling of saliva. EEG shows diphasic and high voltage sharp wave centrotemporal activity. Drowsiness and slow sleep considerably increases the discharge rate. The sharp wave activity is unilateral in majority of patients and can be bilateral and can be outside the centrotemporal area. Spontaneous remission with or without AEDs is the rule. Objective- To know the prevalence of rolandic epilepsy, study about its characteristics and to compare with other studies.
Methods and Observations: Inclusion criteria- 1 Age between 1-14 years of age 2 EEG - Spikes/ sharp waves at centrotemporal/frontocentral region. 3 CT/MRI - Normal or abnormality unrelated to epileptiform activity/syndrome. Exclusion criteria- 1 Age < 1 yr and >14 years. 2 Non progressive encephalopathy cases with epilepsy. 3 Characteristic features of rolandic epilepsy, but interictal routine scalp EEG not suggestive of rolandic or normal. 4 Symptomatic cases. Over a period of 2 years 2500 epileptic patients seen. Between 1-14 years of age group were 280. 30 cases included in the study. Boys and girls were equally affected. Mean age of diagnosis was 7.8 years. Hemifacial motor seizure were present in 86 % of cases and 92% become secondarily generalized, only 8% remains localized to face. 95% has excellent response. Only 2 cases needed 2 AED and 1 case on 3 AED. One of patient has recurrent attacks inspite of multiple AED.
Conclusions: Rolandic Epilepsy is the most common idiopathic partial epilepsy in childhood. It commonly presents with unilateral facial motor seizure with excess salivation and usually well controlled with monotherapy.

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Clinico-etiological profile of Infants with first seizure: an observational study from a developing country

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Purpose: The risk of seizures is the highest in infancy but there is not much data from this region on infants with first seizure.
Method: We studied 75 (61.3% males) consecutive infants (28 days-1 year) presenting with their first seizure to the pediatric emergency. Seizures were classified as per ILAE Classification, 1981. Seizure semiology was determined based on eye-witness account (77.3%), or direct observation.

Routine biochemical studies, inter-ictal EEG, and developmental assessment were done in all infants. Neuroimaging was done selectively.

Results: Mean age was 5.8±3.4 month and 42.7% had seizures as their only complaint; fever was the most common co-morbidity. 57 (76%) patients presented with a first seizure. 93.3% infants had short-lasting (< 15 min) and generalized (72%) seizures. Biochemical studies were abnormal in 27 (36%), with hypocalcemia in 26. 12 CT scans and 10 MRI studies were done in 20 patients. In unprovoked seizures, only 31% of these provided any diagnostic information. Majority of the infants had provoked seizures (68%), 1/3rd of which were due to hypocalcemia. 29.3% had neuroinfections (pyomeningitis, 21.3%). Eight (10.7%) infants had febrile seizures and 5 had Benign infantile convulsions. Thirteen (17.3%) infants had developmental delay, with majority having moderate delay. Nine (12%) infants died during the duration of the study, 2 during the course of a seizure.

Conclusion: Metabolic derangements and neuro-infections were the commonest etiology. Existing management guidelines for infants with an initial seizure need to be modified for our region.

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Comparison of the success of different drug treatments for West syndrome: a single centre 10-year review from Singapore

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Purpose: To compare the success rates of different treatments initiated for infants with West Syndrome.

Method: We reviewed the clinical records and EEG of patients who developed infantile spasms in a 10-year period from 2004 to 2013 inclusive. All infants had EEG with hypsarrhythmia for the diagnosis of West Syndrome. Infants with tuberous sclerosis were excluded. The 4 treatment options for West syndrome were: low dose prednisolone (PNL) at 2mg/kg/day, high dose PNL at 3-5 mg/kg/day, vigabatrin (VGB) of at least 100mg/kg/day, and other anti-epileptic drugs (AEDs) such as valproic acid, nitrazepam or topiramate. We also classified the treatment given as being the first treatment option or if the drug was the second choice following failure of the first drug. We defined success of treatment being complete cessation of infantile spasms and resolution of hypsarrhythmia in the EEG within 4 weeks of the drug treatment.

Results: Amongst 19 patients, low dose PNL was the first choice for 1 infant and second choice for 6. High dose PNL was the first choice for 4, and second choice for 2 infants. VGB was the first choice for 12 and second choice for 2 infants. The other AEDs were the first choice and second choice used in 2 infants each respectively. There were 2 responders out of 7 with low dose PNL, 4 responders out of 6 with high dose PNL, 3 responders out of 14 with VGB, and 1 responder out of 4 with the other AEDs. Comparison of the response rates across the different treatment groups were not statistically significant, with the greatest difference being high dose PNL versus VGB, p value = 0.12.

Conclusion: Excluding tuberous sclerosis, this study suggests that use of high dose PNL in the treatment of West Syndrome may result in a more favorable outcome.

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The pathogenesis of childhood absence epilepsy: NIPA2 mutations enhancing excitability of thalamocortical network through increasing NMDAR strength

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Purpose: To reveal the pathogenesis of Childhood Absence Epilepsy (CAE) caused by the NIPA2 gene mutations (p.I178F, p.N244S and p.N334_335EinsD), functional study of these mutations was conducted.

Method: Immunofluorescence labeling, inductively coupled plasma-optical emission spectroscopy (ICP-OES), MTT metabolic rate detection, computational modeling and extracellular recordings were utilized to elucidate how these mutations results in CAE.

Results: We found NIPA2 (wild-type) proteins were localized to the cell periphery, whereas mutant proteins were not effectively trafficked to the cell membrane in cultured neurons. Furthermore, we found a decrease of intracellular magnesium concentrations in the neurons transfected with mutant NIPA2, but no effect on the survival of neurons. To understand how low intracellular magnesium results in seizures we built and analyzed computational models to simulate effects of mutations. These models suggested that lower intracellular magnesium concentration enhanced synaptic NMDAR currents. We then used a model of the cortical-thalamic network to understand why increased synaptic coupling results in epileptic-like discharges. To support the modeling predictions, we then did experiments in cortical-thalamic brain slices and found increased evoked field excitatory post synaptic potentials (fEPSPs) and epileptiform activity under low intracellular magnesium conditions.

Conclusion: The NIPA2 mutations trap NIPA2 proteins in the cytoplasm, resulting in reduced magnesium influx. Lower intracellular magnesium may enhance the excitability of cortical-thalamic network through increasing NMDAR strength.This is the first demonstration linking NIPA2 mutations to epileptic-like discharges in thalamocortical network. It is also first report to demonstrate the role of a selective magnesium transporter in the pathogenesis of CAE.

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Socio-economic status effects in pediatric cerebral palsy comorbid epilepsy: a national cohort study

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Purpose: Lectures mentions children with cerebral palsy are frequent comorbid with epilepsy. This study aims to investigate the prevalence, age, gender, and socio-economic status effects of pediatric cerebral palsy with epilepsy.

Method: All Taiwan inhabitants aged 1 month to 18 years registered in the National health insurance research database (NHIRD) between 2010 and 2011 were enrolled.Children with cerebral palsy (CP) were identified from the data of Registry for catastrophic illness patients (HV). Epilepsy cases were identified according to International Classification of Disease 9th edition (ICD-9) coding for epilepsy from the totally outpatient and admission Claims of the CP children.

Results: There were totally 4793,535 children enrolled and 6399cerebral palsy patients were analyzed. Among them, 2249 patient had epilepsy. The prevalence of epilepsy in cerebral palsy children was 0.4‰ (95% CI, 0.38-0.42‰). The proportional composition of gender, age, and socioeconomic status of epileptic CP patients were significantly different than those of non-epilepsy CP patients. Male children were significantly more likely to have epilepsy. However the

effect was possible influenced by the gender effect of CP. Preschool age children were significantly having lower prevalence of CP and epilepsy than other subgroup. East Taiwan had significantly higher prevalence than did other areas (p< .01). Bidirectional peaks were found on CP children in families of dependents and the highest quintile economic status.
Conclusion: Epilepsy is really an important issue of CP children and socioeconomic status variants have significant influence on CP with epilepsy in Taiwan.

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Clinical features of postencephalitic epilepsy
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Purpose: This study aimed to investigate the clinical features of postencephalitic epilepsy in children.
Method: Five patients (3 boys and 2 girls; age range 8 months to 9 years) with postencephalitic epilepsy (PEE) were selected from 28 patients who were diagnosed as encephalitis based on the diagnostic criteria by the International Encephalitis Consortium. The clinical data including clinical features, EEG, CSF and MRI findings were analyzed retrospectively.
Results: Eight cases (29%) out of 28 cases had acute seizure and five of them evolved to PEE later on. These five cases were diagnosed as three focal epilepsy and two generalized epilepsy, and they had a median number of one antiepileptic drug at the time of investigation. Four of them showed abnormal MRI findings such as hyperintense lesion in multiple brain which was concurrent with acute viral encephalitis. Based on whether the presence of post encephalitic epilepsy or not, the cases were divided into non PEE (n=23) and PEE (n=5). Although it is hard to say the other factors were not associated to PEE, because of lack of sample size. This study compared the possible risk factors for the PEE including acute symptomatic seizures, status epilepticus, abnormal MRI finding involving cerebral cortex and spikes on EEG, acute symptomatic seizures was the factor for indicating PEE (non PEE; 3 cases (13%), PEE; 5 cases (100%), P< 0.001).
Conclusion: Acute symptomatic seizure may be another risk factor for the evolution of PEE. This study may conclude that patients who had acute symptomatic seizure should be considered as potential patients for epilepsy.

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The attention deficit hyperactivity disorder in children with epilepsy
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Purpose: Attention Deficit Hyperactivity Disorder (ADHD) is known to be more common in children with epilepsy than in the general population. Thirty one to forty percents of ADHD are accompanied with epilepsy. Few studies regarding this matter have been reported in Korea. This study was aimed to evaluate the comorbidity of ADHD in children with epilepsy.
Method: This is a two big center based, retrospective and controlled study at Cheongju in Korea. Thirty four ADHD children with epilepsy and 38 ADHD children without epilepsy from Chungbuk National University hospital and Cheonju St. Mary´s hospital were recruited from January 2010 to June 2012.
Results: In ADHD children with epilepsy, twelve (35.2%) had partial seizures, 11 (32.2%) did generalized seizures and 11 (32.2%) were unclassified. EEG abnormalities were found in the frontal

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lobe (15 cases), in the central lobe (7 cases), in the temporal lobe (6 cases), and in the occipital lobe (3 cases). In ADHD children with epilepsy, the combined type was majority (76.4%) and otherwise in ADHD children without epilepsy, the inattentive type was main (50.5%) (P=0.004). Learning disability was more common in ADHD with epilepsy than in ADHD without epilepsy (P=0.01).
Conclusion: This study showed that ADHD children with epilepsy are more likely to have combined type (76.4%) and learning disability as compared with ADHD without epilepsy

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The clinical, electroencephalographic and genotypic characteristics of SCN1A mutation-positive Dravet syndrome
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Purpose: Dravet syndrome or severe myoclonic epilepsy of infancy (SMEI) is a severe infantile-onset epileptic encephalopathy. It has a mono-genetic aetiology with 70-80% of patients carry sodium-channel alpha-1-subunit (SCN1A) gene abnormalities. The aim of this study is to look at the characteristics for SCN1A mutation-positive cases of SMEI.
Method: All cases of SMEI confirmed with SCN1A mutation, seen in paediatric neurology clinic, Penang Hospital, Malaysia were included. The clinical, electroencephalographic and genotypic characteristics of these patients were reviewed.
Results: Seven cases of SCN1A mutation-positive SMEI were identified. The mean age was 7.4years. Six of them (86%) were girls. Five (70%) had normal development premorbid. However, all had some forms of developmental delay during last follow-up. The mean age of onset for first seizures was 7months. All patients had both febrile (FS) and afebrile seizures with four patients (57%) presented initially with FS. The seizure semiology included generalized tonic-clonic in 3(43%), complex partial in 3(43%) and myoclonic in 2(29%). Status epilepticus was noted in 2(29%). Six patients had frequent seizures on presentation. Throughout mean follow-up of 6 years, 2 were seizure-free (>6-months), 2 had >95% seizure-reduction, 2 had 50-75% seizure-reduction and one showed no improvement. Multiple anti-convulsants were required to achieve such seizure-control. Valproate, topiramate and benzodiazepine in variable combination seemed helpful for seizure-reduction. Of the17 EEGs done, background activity was normal in 14 and mildly abnormal in 3. Four had non-specific sharp-transients particularly over bilateral frontal regions. Epileptiform discharges (multifocal / diffuse) were present in 4. Genotypically, 1, 2 and 4 had frameshift, missense and nonsense mutation respectively.
Conclusion: Patients with SCN1A mutation-positive SMEI had seizures of infantile-onset and variable semiology. Multiple anti-convulsants were needed to achieve better seizure-control. Ironically, most of the EEGs did not show much abnormality. Truncating mutation in SCN1A gene was most commonly found.

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The efficacy of rectal diazepam in aborting seizures in paediatric patients following caregiver education: a single-centre Singapore experience
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Purpose: Paediatric patients with seizure disorder are often affected by acute repetitive or continuous seizures that may last several minutes to hours. Rectal administration of diazepam is one available treatment for these seizures. The purpose of this study was to assess the effectiveness of caregiver administration of rectal diazepam and its efficacy during seizure recurrences following instructions by a paediatric epilepsy nurse.
Method: This retrospective study included 956 patients aged 0 to 15 years old who had either epileptic seizures or febrile seizures in the seven year period from 1 March 2006 to 28 February 2013. Caregivers were taught how to identify convulsive seizures and to administer diazepam rectally if the seizures lasted longer than 5 minutes, or if the seizures did not stop by the time they obtain the rectal diazepam tube. Only patients who subsequently had seizure recurrence and were managed at our Children's Emergency were included in the analysis.
Results: Ninety seven patients who had seizures were reviewed at the Children's Emergency. Out of these, 77 (79%) had rectal diazepam administered at home. The seizures stopped after administration of rectal diazepam in 64 (83%); the remaining 13 (17%) required further intravenous anti-convulsant treatment in the hospital.
Conclusion: Following education by a healthcare professional, caregiver administration of rectal diazepam was effective in stopping 83% of subsequent seizure recurrences. It is a reassuring safety net for patients who are prone to prolonged seizures.

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Automated detection and video analysis of nocturnal childhood events (ADVANCE)
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Purpose: Nocturnal childhood seizures cause great concern to parents and caregivers of epileptic children. This is especially the case, since unwitnessed seizures could lead to SUDEP. Thus, prolonged monitoring by parents and caregivers can lead to high stress and negative impact on productivity and quality of life. To address this, we developed a video analytics system to assist in the unsupervised monitoring and automated detection of hyper-motor seizures in pediatric patients.
Method: Pediatric patients admitted to the Epilepsy Monitoring Unit (EMU) in our institution were recruited. Videos of clinical events and background activity were recorded using a fixed camera in the EMU. Patients with seizures during their stay were selected for analysis. Eight-hour long continuous epochs, comprising daily activities and seizures were analysed.
Results: 21 seizures in 10 patients were analyzed in a dataset consisting of 150 hours of videos. Detections by the system were compared to manual interpretation of seizure onset. The system achieved a sensitivity of 95.20% and a specificity of 74.10%, with one missed seizure. Average latency from seizure onset to detection was 25.2 seconds.
Conclusion: Automated video seizure detection is feasible as a non-invasive monitoring solution for pediatric patients. The system is able to achieve accurate detection rates, reasonable false alarm rates and low miss rates. False alarms are typically caused by large patient movements. The system could serve as a complementary non-invasive solution for monitoring of pediatric patients.

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Comparison of treatment efficacy between oral steroid and ketogenic diet for patients with infantile spasm

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Purpose: Infantile spasm is an age-dependent unique epilepsy syndrome characterized by clinical spasm, hypsarrhythmia at a particular age usually around 5 months. There are only few pharmacological and non-pharmacological treatments. Comparing the efficacy of oral steroid and that of ketogenic diet (KGD) may be beneficial to suggest which treatment should be considered first, in the early stage after pharmacological failure.
Method: We reviewed 132 patients with infantile spasm who tried oral steroid or ketogenic diet treatments. We excluded children: who did not have typical hypsarrhythmia; who tried >3 anti-epileptic drugs (AEDs) before hormone or KGD; and who tried those treatments after 24-month old. Treatment efficacy was measured as seizure outcome in 3-month and long term final outcome: seizure free; >90% reduction; >50%; < 50%; and no change.
Results: There was no difference in demographics between groups who tried hormone or KGD. Seizure outcome in 3 months was not statistically different between two groups. Median follow-up period was 3.1 years. Overall 17 of 54 (31.5%) patients evolved into Lennox-Gastaut syndrome (LGS). Eventual numbers of patients without seizure did not significantly differ between groups. Patients with seizure free in 3 months had been treated earlier with hormone/KGD after seizure-onset compared to those without (p=0.004). In addition, who responded better showed earlier response compared to who did not (p=0.015).
Conclusion: Ketogenic diet should be considered as early treatment option with a first line AED failure.

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Sleep architecture of benign childhood epilepsy with centro-temporal spikes

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Purpose: Benign childhood epilepsy with centro-temporal spikes(BECTS),also known as benige rolandic epilepsy (BRE) is one of the most common epileptic syndromes during childhood.Our aim is to study the interictal whole night sleep architecture of BECTS patients,the differences when compared with normal controls,as well as the relationship between sleep and epilepsy.
Method: Twenty-one patients (14 male and 7 female; mean age 10.14 years) with benign childhood epilepsy with centrotemporal spikes were recruited for this study.The normal control group consisted of twenty-one age- and sex-matched healthy children who were retrospectively enrolled from our database of sleep recordings during the past 4 years. All participants underwent a continuous overnight polysomnography (PSG) . Sleep analysis was performed according to the international criteria of the AmericanAcademy of Sleep Medicine(AASM).The Epworth Sleepiness Scale (ESS) was used to evaluate daytime sleepiness.
Results: Compared with the control group,the patients in BECTS group had significantly higher percentage of non-rapid eye movement (NREM) stage 1 sleep from total sleep time(16.32±8.19, p< 0.05), and increase in sleep onset latency(19.79±14.73, p< 0.05) as well as arousal (13.62±6.31, p< 0.05). The same patients showed lower proportion of stage 2 from TST(40.08±8.83, p< 0.05) and sleep efficiency(88.24±8.17, p< 0.05). The percent of rapid eye movement (REM) sleep and

ESS score was not significantly different between the subjects and controls(p>0.05).
Conclusion: The sleep architecture has a close relationship to epileptic seizures. The sleep parameters changes significantly in the patient group,which indicates sleep structure of BECTS children was impaired and sleep quality decreased.Therfore, evaluation and monitoring of sleep situation in BECTS children and early intervention for patients with sleep disorders should be considered as an important part of the treatment to control the seizures and improve the quality of life.

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Therapeutic effects of levetiracetam on electrical status epilepticus during sleep in children

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Purpose: To study the efficacy of levetiracetam (LEV) in the treatment of electrical status epilepticus during sleep (ESES) in children.
Method: We retrospectively study the clinical data of 30 children who were newly diagnosed with ESES and treated with LEV between January 2011 and June 2013 and followed up for at least 6 months.
Results: There were 17 male and 13 female.The onset age of the 30 children ranged from 15 months to 9 years and 7 months,the average age of 5 years and 6 months. The age to detect the ESES was from 1 year and 10 months to 11 years and 9 months.Focal seizures were found in 83% of the children in the early stage.Twenty-five children administrated LEV treatment after ESES were definitely diagnosed. Of the 25 children, 20 were diagnosed as epilepsy syndrome of benign childhood epilepsy with centrotemporal spikes (BECT).The age of the patients at the beginning of LEV treatment ranged from 1 year and 10 months to 12 years and 3 months.The follow-up duration was from 9 to 20 months. The effective rate of LEV for seizure control was 83% and for EEG recovery was 79%. The other 5 children administrated LEV treatment before the occurrence of ESES. Seizure control and EEG recovery were noted in three of the 5 children.
Conclusion: LEV treatment is efficacious for both seizure control and EEG recovery in children with ESES.

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SIngle center study of predictors of outcome in childhood epilepsy in developing country like India

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Purpose: To identify predictors of medically intractable epilepsy in children
Method: A retrospective analysis of a cohort of 658 children (age 1 month to 16 years) with epilepsy, with a minimum follow-up of 2 years was performed. Aetiology and epilepsy syndromes were classified using the International League Against Epilepsy (ILAE) guidelines. Intractable epilepsy was defined as those with more than 1 seizure per month over 2 years with failure of three or more anti-epileptic drugs
Results: Descriptive statistics were done; odds ratio (OR) was calculated for various parameters to determine predictors of intractable epilepsy. Univariate & multivariate analysis was performed. Results: Childhood epilepsies accounted for 24% of epilepsies attending the epilepsy clinic; 57% were males. The mean duration of follow up was 2.8(range 2-9) years. According to ILAE classification 65% of children had symptomatic epilepsies, 18.4% idiopathic and 16%

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cryptogenic.
Conclusion: Refractoryepilepsy was found in 36.7%. The predictors of intractable epilepsy {OR (95% CI)} were male sex 1.6(1.15-2.29), age of onset ofepilepsy < 1 year, symptomatic epilepsies and neonatal seizures. Hypoxic ischemic insult during perinatal period is a major preventable cause of childhood symptomatic epilepsies in developing countries

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A child presented atypical absence, atonic, spasms, tonic diagnosis LGS versus SSPE?
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Purpose: According to clinical presentation, Electroencephalography (EEG), and brain imaging findings. We explore the crucial point of differential diagnosis between SSPE (subacute sclerosing panencephalitis, SSPE) and LGS (Lennox-Gastaut syndrome) on the early stage.
Method: We have analyzed and summarized in detail the clinical data on a SSPE child who was admitted to the department of pediatric neurology of our hospital and was early diagnosed LGS.
Results: A child whose EEG showed multi-focal and generalised abnormalities had presented atypical absence, atonic, spasms, tonic at onset. He had once been misdiagnosed as LGS. The child developed gradually intellectual deterioration and progressed to consciousness abnormalities, decerebrate and decorticate rigidity. finally, SSPE was confirmed for the child according to the result of brain biopsy.
Conclusion: The onset symptom of patient is characterized as polymorphic seizures when periodic changes of EEG between the two tapes of seizures are similarity. We should be asked about the medical history and notice the likelihood of SSPE.

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Clinical analysis and electroencephalography features in idiopathic childhood occipital epilepsy of panayitopoulos syndrome
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Purpose: To investigate the clinical Electroencephalography (EEG) features and prognosis in children with idiopathic occipital epilepsy of panayitopoulos syndrome.
Method: A retrospective review was conducted of 45 children patients who are diagnosed as idiopathic occipital epilepsy of panayitopoulos. All of them were treated with antiepileptic drugs according to the seizure typies. The prognosis were reviewed. The clinical feature and EEG were analysed.
Results: In total,45 children with idiopathic childhood occipital epilepsy of panayitopoulos enrolled in this study. The seizure of ictal clinical manifestations starts with mainly emetic (73.3%), ictal syncope (8.8%), impairment of consciousness (71.1%), deviation of the head and eyes (66.7%), hemiconvulsions (17.7%) occur above patients in late period. Nearly half of these seizures last more than 30 min. Interictal EEG (62.2%) showed high-amplitude sharp, spike and wave discharge on the unilateral or bilateral occipital and posterior regions .Instead, they have extra- occipital spikes (26.7%) only, a consistently normal EEG 17.7%. Most of them was treated monotherpy,some required combination therapy 17.7%, 8.9% cases bad poor response to multiple antiepileptic drugs.
Conclusion: Panayitopoulos syndrome idiopathic childhood-related idiopathic benign susceptibility to focal, mainly autonomic, seizures and autonomic status epilepticus. Most of EEG reveals functional, mainly multi-focal, sharp, sharp-slow wave complexes. Spikes often occurs

at various posterior locations. The seizure commonly starts with mainly ictus emetic.17.8% of patients have only a single seizure, only 8.9 % have very frequent seizures, (71.1%) Remission commonly occurs within1-2 years from onset. The good outcome of treatment with antiepileptic drugs, and the prognosis is mostly favorable.

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Clinical observation of Oxcarbazepine suspension monotherapy for 4 to 14-year-old patients with focal epilepsy

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Purpose: To investigate the efficacy and safety of oxcarbazepine (OXC) suspension to treat the patients with focal epilepsy in children aged from 4 to 14 years.

Method: A total of 98 patients who were selected from the outpatients of the pediatric neurology in our Hospital from January 2012 to December 2013,newly diagnosed 4-14 years old patients with focal epilepsy,were randomly divided into the experimental group of 50 patients and the control group of 48 patients. Experimental group: OXC suspension , the initial dose was 8-10mg/kg/d, the target dose was 20-40 mg/kg/d. Control group: oral administration of carbamazepine (CBZ) syrup, the initial dose was 5 mg/kg/d, increasing the dose once every 5-7 days up to 10-15 mg/kg/d, The observation period was 26 weeks.

Results: The rate of valid cases in OXC group after 13 weeks and 26 weeks were 76.0%(38/50) and 70.0%(35/50), the rate of non-attack cases were 52.0%(26/50) and 50.0%(25/50) ; the rate of valid cases in CBZ group after 13 weeks and 26 weeks were 68.7%(33/48) and 62.5%(30/48), the rate of non-attack cases were 52.1%(25/48) and 43.7%(21/48).The efficacy between two groups has no significant different (P>0.05). In the 26th week, the rates of adverse reactions of OXC and CBZ were 18.0% (9/50)and 35.4%(17/48),with significant difference(P<0.05).The quit rate of OXC group was 6.0%; 2 cases for rash and 1 for uneffective, while the quit rate of CBZ group was 12.5%,5 cases for rash and 1 for uneffective.

Conclusion: Oxcarbazepine suspension monotherapy patients with focal epilepsy was significant effective.the rate of the adverse reactions in the experimental (OXC) group was relatively fewer, and the extent was slight. Oxcarbazepine suspension might be considered as the first choice to treat 4 to 14-year-old patients newly diagnosed with focal epilepsy.

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Case analysis of worsening of partial seizures in children with oxcarbazepine monotherapy

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Purpose: Oxcarbazepine is the drug of first choice recommended by ILAE for epilepsy with partial onset seizures. But the epileptic seizures may be exacerbated by initiation of therapy of the drug. The present study is aim to analyze the clinical characteristics of a group of pediatric patients with worsening of paitial seizures with monotherapy of oxcarbazepine (OXC).

Method: We performed a retrospective analysis of to identify the children who were diagnosed as epilepsy with partial seizures and treated with OXC over the past 2 years. History, neurological examination, and EEG findings were reviewed.

Results: Of 95 patients, we identified 5 patients with exacerbation of partial seizures, who developed either worsening of preexisting seizures, and/or EEG deterioration following introduction of OXC monotherapy. Four of 5 patients occurred in the early stage of the application. Only 1of them occurred 1 year after the treatment. Following substitution of OXC with a broad spectrum AED, significant improvement of seizure control and EEG was observed.

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Conclusion: These findings suggest that OXC can aggravate partial seizures and/or worsen EEG features in children. Following initiation of therapy with OXC, monitoring patients with EEGs may be important, especially in patients who is in the early stage of the application and do not show adequate response to therapy.

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Clinical and electroencephalographic study of children frontal lobe epilepsy

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Purpose: To analyze the characteristics,electroencephalography (EEG) features, therapeutic effects and prognoses of 25 cases of frontal lobe epilepsy (FLE) in children.
Method: A retrospective review was conducted of 25 children patients who are admitted in Department of Pediatric Neurology, First Hospital of Jilin University from January, 2010 to January, 2013.
Results: Frontal lobe epilepsy with frequent clinical seizures was characterized by onset of clusters especially in sleep. Seizure duration was always short with sudden start-stop,and their consciousness would recover relatively soon after seizure attacks. The interictal dynamic EEG in 36% of the cases showed frontal lobe epileptiform dischanrge, which was found in the EEG during seizure attacks in 68% of the cases. Drug therapy was effective in 80% of the cases, in which 28% showed complete seizure control.
Conclusion: The clinical features of FLE is relatively distinct, which has low rate of EEG abnormality during the interctal period or seizure attack. We should identify it with night terror and temporal lobe epilepsy. FLE is more likely to occur in sleep, so long-range EEG is of vital importance in the diagnosis of FLE.

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Malignant migrating partial seizures in infancy: clinical case

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Purpose: Study of electro-clinical characteristics of malignant migrating partial seizures in infancy (MMPSI).
Methods: Clinical case of MMPSI at the girl of 4 months.
Results: The diagnosis of MMPSI was verified at the age of 4 months when patient turned to the hospital with complaints to the dysphagia, apnea episodes, concern, seizures. In structure of etiological factors the mixed hypoxemic-ischemic and infectious (CMV infection) damage of the CNS. Polymorphism of epileptic seizures with high frequency: to 46 seizures per day. Debut of seizures in the form of the tonic tension of extremities, apnea with a cyanosis, myoclonias of blepharons. Further myoclonic bilateral, tonic versive and opercular seizures and autonomic features such as salivation, sleep disturbance, facial flushing joined. The status epilepticus was observed twice. Neurological status: microcephaly, atrophy of optic nerves, muscular hypotonia, hyperkinesis, pseudobulbar violation, delay of psychomotor development. The ictal EEG: diffuse delay of the background activity, ictal patterns from different independent areas of both hemispheres. MRI: hypoxic-ischemic changes.
Polytherapy (VPA+LEV,VPA+TPM) did not render essential effect and reduced the frequency of seizures till 17-20 per day (more than 50%). In case of the status epilepticus the using intravenous valproate (Convulex) significantly decreased seizure frequency. Hormonal therapy rendered a short-term positive effect in a disease debut. In dynamics the condition of the

child progressively worsened. The lethal outcome was caused by heavy pneumonia against the CMV-infection reactivation.
Conclusion: The presented case is classical MMPSI option. Age of a debut till 6 months. The epileptic syndrome is presented very frequent and polymorphous seizures with development of status epilepticus. Progressing increase of a neurologic symptomatology. EEG picture: formation of erratic independent multiregional focuses. MRI showed existence of moderate atrophic changes of the brain. Seizures were often difficult to control with standard AEDs.

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Recurrence rate and risk factors for recurrence of seizures after withdrawal of antiepileptic drugs in children treated for epilepsy

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Purpose: Epilepsy is treated with anti-epileptic drugs (AED) for a period of 2-3 years after which they are withdrawn. We studied the rate of recurrence and risk factors for the same in our pediatric epilepsy patients who have undergone withdrawal of AED.
Method: 142 patients were selected retrospectively from records as well as prospectively followed from the day of withdrawal. Data was entered on an excel sheet and univariate analysis for risk factors using Chi Square test was done. Multivariate analysis was done using Cox regression.
Results: The seizures recurred in 32%, The risk factors found significant on univariate analysis were duration of active epilepsy (more than 2 years), symptomatic etiology, history of neonatal seizures, concomitant cerebral palsy, response time after starting AED (more than 12 months), more than 2 seizures after starting AED and total duration of AED more than 3 years. On multivariate analysis, factors found significant were duration of active epilepsy (more than 2 years), total duration of AED more than 3 years and age of withdrawal of AED at more than 10 years.
Most of the previous studies showed different combinations of risk factors to be significantly associated with recurrence. There is no single risk factor to predict the risk of recurrence. Children with more number of risk factors may have a higher risk of recurrence.
Conclusion: The rate of recurrence after AED withdrawal was 32%. While withdrawing AED, It is difficult to counsel parents regarding risk of recurrence as there is a lack of consensus on risk factors in the literature. Caution should be exercised when the above mentioned risk factors are present. More such studies covering larger population base are required.

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Developmental outcomes within the first year of diagnosis; a descriptive study of children diagnosed with infantile spasms

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Purpose: Infantile spasms result in adverse developmental outcomes. The developmental attainments depend on multiple factors. We followed up a cohort of infants with infantile spasms.
Method: A prospective cohort study (a part of a larger single blinded randomized control trial to assess the response to treatment)
Newly diagnosed children with infantile spasms presenting to a neurology unit.

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A single trained investigator conducted developmental assessments at presentation and after one year of interval from the point of commencement of treatment. Bayley III Infant and Toddler developmental scales were used to assess cognition, language (receptive and expressive) and motor (gross and fine).
Bayley raw scores were calculated and converted to scaled scores. The mean differences in scores from presentation to 1 year were compared using paired t test. Infants were divided in to two categories according to the age of onset (≤ 6 months), the duration of spasms (≤ 30 days), and the response to treatment by day14 (absent/ present). These were compared with the developmental attainments at the completion of first year to establish any relationships with the outcomes, using independent sample t test.
Results: 46 infants completed one year follow up at a mean dyration of12.06 months (SD=3.51). Mean age of onset of seizures was 6.57 (SD=4.87) months. The mean age at presentation was 9.25 (SD=6.07) months. The mean gap between onset of spasms and the presentation was 71.15 days (SD=75.47). 60.9% had no spasms by 14 days. The mean comparisons of the scaled scores showed a deterioration of scores in all domains at one year with no significant relationship with any risk factors.
Conclusion: Majority of children had low scores in all areas of development after 1 year of follow-up. There was no statistical significance in risk factors to the outcomes due to smaller numbers.

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Medical treatment of children with electrical status epilepticus in sleep
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Purpose: To elucidate an effective therapeutic strategy for children with electrical status epilepticus in sleep (ESES).
Method: Twenty patients with ESES who came from our pediatric neurology inpatient clinics had been treated between 1995 and 2013.
Results: Seven(35%) children had benign partial epilepsies of childhood, four (20%) had cerebral palsy, three (15%) had hydrocephalus, one (5%) had schizencephaly, and the etiology was unclear in five (25%). The duration of ESES ranged between 4 and 30months. The antiepileptic drugs that were found to be efficacious were: levetiracetam (41%), clobazam (31%), and sulthiame (17%). Twelve patients (60%) had cognitive deterioration, whereas the rest presented with regression in attention, speech, communication, and behavior. There was a significant correlation (p = 0.02) between the duration of ESES and residual intellectual deficit at follow-up. Specialy speaking ,the patients who under 4 weeks of relatively high daily doses of diazepam (0.5-0.75 mg/kg body weight) seem to be effective in their EEG monitoring.
Conclusion: The most efficacious antiepileptic drugs are levetiracetam and clobazam, Valproic acid, lamotrigine, topiramate, and ethosuximide showed no efficacy.

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Preliminary clinical reserch on levetiracetam as an add-on therapy in myoclonic-astatic epilepsy
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Purpose: To observe the effect of Levetiracetam (Lev) therapy for as an add-on therapy in myoclonic-astatic epilepsy.

Method: To select the myoclonic-astatic epilepsy patients (outpatients and hospital patients of department of pediatric neurology and department of pediatric rehabilitation of The First Hospital of Jilin University), 4 boys and 6 girls,11months - 4.5 years old, the mean age was (20.9 ± 13.1) months. to used levetiracetam as an add-on therapy.
Results: After adding levetiracetam,seizures in all cases (10/10) were reduced obviously without apparent side-effect. 60% (6 /10) was seizure-free and the longest time without any epileptic event was up to 6 months. There was no obvious side effect occurred.
Conclusion: Levetiracetam therapy could lessen the seizures in Myoclonic-astatic Epilepsy, the therapy is fast acting, safe, and without obvious side effect.

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The clincal audit of effectiveness of seizure control and side effects of using ketogenic diet in refractory paediatirc epilepsy: experince of a regional hospital in Hong Kong from 1999 to March 2014

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Purpose: To audit seizure outcome and side effects of Ketogenic Diet in Paediatric Refractory Epilepsy.
Method: Refractory epilepsy patients put on Ketogenic Diet admitted to hospital for monitoring urine ketone, haemoglucostix, sign of dehydration. Ketogenic diet was gradually stepped up. Regular blood test pre and post KD e.g.complete blood pictue, liver and renal function test, Calcium, Phosphate, Urate, Venous Blood Gas, Lactate, Ammonia, Lipid and Clotting profile, Carnitine, Iron, Selenium, Zinc, Magnesium. Urine for Calcium, Creatinine to screen for hypercalciura. Rountine urine miscocropes for haematuira. Renal Ultrasound look for renal stone. Side effects related Ketogenic Diet reported. Seizure outcome was grouped into: > 50% seizure reduction, < 50% seizure reduction, no significant seizure change.
Results: From 1999 to Feburay 2014, 14 patients put on Ketogenic Diet. Age of starting Ketogenic Diet ranged 4 months - 11 years (mean age:7.3 years) Duration of Ketogenic Diet ranged 2 months - 168 months (mean duration: 29 months). 7 patients had MCT oil, 7 patients had Classical oil. 1 patient failed tolerate KD. 38%/5 patients showed > 50% seizure reduction (Succinic Semi-aldehyde Dehydrogenas Deficiency 1, Ohtahara´ syndrome 1, Mitochrondrial Cytopathy Complex I & IV Enzyme Deficiency 1, suspected neuro-metabolic disease 2). 46%/6 patients showed < 50% seizure reduction (1 Hypoxic Ischemic Encephalopathy, 1 post-HSVencephalitic epilepsy,1 congenital CMV, 3 Lennox Gastaut Sydrome). 16%/2 patients with Focal Cortical Dysplasia had no long term seizure improvement, but 1 of them showed short term seizure reduction. 46%/6 patients continue Ketogenic Diet; 53%/7 patient discontinue Ketogenic Diet due to: sepsis1, aspiration pneumonia1, peritonitis1; platuae seizure improvement 4. Side effects:2 Hypercalciuria (1 improved by potassium citrate); 1 Iron deficiency; 1 Zinc deficiency;1 Hyperuricaemia;1 Hypertriglyceridaemia correctable by supplement, dietary adjustment.
Conclusion: Ketogenic Diet is effective in refractory epilepsy, especially those with underlying Neuro-metabolic disease, but so effective in Cortical Dysplasia. Beware of infection.

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Developmental outcome in children of infantile spasms with focal cortical dysplasia

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Purpose: We investigated developmental outcome and other clinical factors in infantile spasms patients with focal cortical dysplasia.

Method: This is a retrospective study of 23 children with infantile spasms and focal cortical dysplasia who had treatments including antiepileptic drugs, ketogenic diet and epileptic surgery dysplasia at Severance children's hospital from 2008.3.1 to 2014.2.28. We surveyed patients´ characteristics (seizure onset age, epilepsy duration, lead time to surgery, mean number of AEDs, and so on) and outcomes of treatment (developmental score, seizure outcome).

Results: Among 23 children, 6 of them (6/23, 26.1%) were treated only with AEDs and 11 (11/23, 47.8%) were tried on ketogenic diet. Children who underwent epileptic surgery were 16 (16/23, 69.6%) and 10 of them (10/16, 62.5%) had history of ketogenic diet. 16 (69.6%) out of 23 children were found to have mental retardation (Social Quotient< 70). And Shorter epilepsy duration(duration of epilepsy including infantile spasms from clinical onset to cessation), shorter lead time to surgery (time from clinical onset to 1st respective surgery for FCD) and focal MRI lesion were strong predicted factors for better neurodevelopmental outcomes. Seizure onset age, initial SQ and number of tried AEDs were somewhat related with the outcomes, but no statistically available effect.

Conclusion: Early and active seizure control can lead to shorter epilepsy duration and it can prevent children with intractable epileptic encephalopathy from functional declining and may contribute to better developmental outcome. Recovery from epileptic encephalopathic condition to restore baseline developmental potential is the goal of various treatments including surgery.

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EEG features, treatment and developmental prognosis of intractable absence seizures

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Purpose: Absence seizure (AS) is one of generalized epilepsy, usually benign and seizure and developmental outcomes are good, however, some absence seizures are very intractable. We studied its EEG features, treatment and developmental prognosis.

Method: We examined interictal EEG, treatment, duration of seizures and developmental outcome(prognosis) in 7 cases that have paroxysmal unresponsiveness and > 10 seconds of generalized spike-waves (GSW) on EEG and did not responded to full dose of medicines for AS.

Results: The AS started at 3 and 5.4 years of age, and was treated for 1 and 5 years. Fore cases did not responded to VPA+ESM and two cases did not respond to VPA, and all cases were also refractory for various antiepileptic drugs (AEDs) for partial seizures. Interictal EEG showed not 3 Hz but 3.5-4 Hz GSW with slightly preceded spikes or polyspikes over the frontal areas. They did not respond to AEDs for partial seizures of frontal lobe origin. The AS finally ceased with a combination of full dose of AEDs for generalized seizures and partial seizures (ESM+CZP+CLZ, ESM+ZNS+GBP, ESM+VPA, ESM+VPA+ST+CLZ, VPA+CLB, VPA+CLZ, ESM+CLB). AS recurred when ESM was removed (withdrawn) in 3 cases because the seizures were regarded as partial seizures. AS ceased finally at 1 and 5.5 years from onset. Two of five cases whose duration of AS was longer than 4 years attended specialized class and resting three attended regular class but showed poor school performance.Two cases with short duration of AS showed average

performance in school.
Conclusion: Intractable AS are not generalized but originates from the frontal are, and it requires combination therapy of AEDs both for AS and partial seizures. Long-standing AS may results in mental retardation, and proper diagnosis and treatment for frontal absence is important.

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Quality of life in children on the ketogenic diet
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Purpose: The definition of Quality Of Life (QOL) as per World Health Organization (WHO) reflects the view that quality of life refers to a subjective evaluation which is embedded in a cultural, social and environmental context. In some individuals the psycho-social problems may be more debilitating than the seizures themselves.
Ketogenic Diet (KD) which is used mainly in uncontrolled epilepsy.
The aim of the current study is to determine shifts in QOL in patients on KD.
Method: The Quality of Life in Childhood Epilepsy (QOLCE) questionnaire was rated by the caregivers pre and post KD. In addition to epilepsy most of the 30 patients evaluated were also physically and mentally challenged.
Results: In the domains of physical restriction, energy fatigue, attention and concentration, language and social activities a 30 to 40 percent improvement was observed. Almost all had improvement in general health and overall quality of life domains.
Conclusion: In the domains of physical restriction, energy fatigue, attention and concentration, language and social activities a 30 to 40 percent improvement was observed. Almost all had improvement in general health and overall quality of life domains.

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A study on the etiology, clinical profile and response to treatment of children with West syndrome
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Purpose: To study the clinical profile, etiology, seizure types and frequency, the response to treatment of children with West syndrome
Method: Case series study was done in children between the age group 0 and 10 years presenting with the classical features of West Syndrome during the period of 1 year from July 2012 to June 2013. Detailed history taking, clinical examination, and investigations in the form of neuroimaging, EEG, and relevant metabolic workup were done. In 78% ACTH was started and in the rest other antiepileptic drugs were tried, like Valproate, Levetiracetam, Clobazam and Vigabatrin in the order of decreasing frequency. These children were followed up and response to treatment was assessed
Results: A total of 14 children (6 boys, 8 girls) were studied. 92% of children developed West syndrome in the first year of their life. The most common type of WS was Flexor spasms in 64%. The commonest cause of West syndrome was Cerebral Palsy due to birth asphyxia (85%). EEG showed Hypsarrhythmia in 50 % and Modified Hypsarrhythmia in 50% of study population. Complete cessation of spasms was seen in 6 children (42%). 7% had complete remission and normalization of developmental milestones and EEG, on ACTH alone. 35% had persistence of spasms even with ACTH & 1 or 2 antiepileptic drugs. Average response time to treatment was 2 weeks. Frequency of spasms was reduced by 75%, while 25% of spasms persisted. 92% of children had GDD. 35% of all children evolved into Lennox-Gastaut syndrome

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Conclusion: 92% of children with West Syndrome presented in the 1st year of life The commonest cause of West syndrome was Cerebral Palsy (85%) due to birth asphyxia. West Syndrome being a severe form of epileptic encephalopathy of early infancy, early identification and timely intervention has helped 42% of children to achieve seizure control.

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Comparison of levetiracetam and carbamazepine in children with newly diagnosed partial onset seizures: a neurocognitive assessment

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Purpose: This study aims to prospectively evaluate the effect of levetiracetam on neurocognition, behavioral issues and quality of life, as well as its seizure control efficacy and other adverse events in pediatric epilepsy patients, in comparison to carbamazepine, one of classic antiepileptic medication, widely prescribed for both partial and generalized seizures.

Method: Total 130 children from age 4 to 16, newly diagnosed with partial-onset epilepsy, have been screened and 123 patients were randomly assigned to levetiracetam and carbamazepine in a multicenter, open-label, parallel-group trial. Series of neuropsychological assessment, behavioral evaluations of patients were performed before and after 52 weeks of study period

Results: Total 121 intention-to-treat(ITT) were followed and final 81 (41 levetiracetam, 40 carbamazepine) patients. Patients randomized to carbamazepine had shown decreased Social Quotient (SQ) (p-value = 0.032) and increased impulsivity (p-value = 0.07) at final follow up, but, children's depression inventory scores (CDI) has dropped. (p-value = 0.027) Levetiracetam prescribed patients had demonstrated improvement in internalizing behavioral problems in Korean Child Behavior Checklist(K-CBCL). Both medication did not display significant difference in follow up scores of Korean-Wechsler

Preschool and Primary Scale of Intelligence(K-WPPSI) / Korean Wechsler Intelligence Scale for Children III (K-WISC). For both mean seizure reduction rate and 50%/100% seizure reduction percentage, levetiracetam and carbamazepine have shown excellent results, 97.72% and 95.35% of both groups with more than 50% reduction of initial seizure frequency.

Conclusion: This multicenter prospective randomized study suggests that while both levetiracetam and carbamazepine may show varying results on the patients' neurocognitive function, behavioral issues and quality of life, such effects are not significant. Both medications were also equally effective in seizure control, with no significant difference in adverse event rate.

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Predictive factors for severe epilepsy at first seizure, in children with tuberous sclerosis complex

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Aim: Tuberous Sclerosis Complex (TSC) carries a heavy burden of refractory epilepsy. TSC is now often diagnosed early, even before seizures have begun. Our study evaluates early predictors towards refractory epilepsy in TSC children with newly diagnosed epilepsy.
Methods: Audit of children followed for TSC and epilepsy at the Neurology Clinic, KK Women and Children's Hospital from 1995 to 2013.
Results: Thirty-six children were evaluated. TSC was diagnosed antenatally or at birth in 13 (36%). Seizures were the first presenting symptom in 20 (56%). Seventeen (47%) children eventually met criteria for refractory epilepsy (failed ≥2 antiepileptics), 17 had mild epilepsy and 2 have no seizures. Median age at first seizure in the refractory group was 5.3 months (range 2.2-117 months) and 15.4 months (6.0-58.2 months) in mild epilepsy (p=0.0001). Risk factors for refractory epilepsy at first seizure were age < 1 year (any seizure type, OR 13.8 (95%CI 2.32-81.5)), infantile spasms (OR 24.4 (3.82-155)). The occurrence of ≥3 seizure phenotypes showed a positive trend (OR 5.25 (0.90-30.62)). Febrile seizures appeared protective (OR 0.07 (0.012-0.35)). In 8 children, this was the only seizure phenotype, and a first presenting seizure in 10 children. At first seizure, the presence of multiple cortical tubers, an abnormal EEG, and concomitant cardiac/renal lesions were not predictive of refractory epilepsy. Diagnosis of TSC antenatally or at birth did not influence seizure outcome.
Conclusion: Early onset seizures, infantile spasms, and a lack of febrile seizures were risk factors towards refractory epilepsy in TSC children.

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Efficacy and safety of drug adjustment using intravenous anticonvulsant for epilepsy patient treated with multiple oral antiepileptics

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Introduction: In Japan, patients with intractable epilepsy are often treated using combinations of two or more antiepileptic drugs (AEDs). Since 2007, newer AEDs such as topiramate, levetiracetam, and lamotrigine have been available and were brought into the current therapy regimens in differing combinations. We found, however, that in some cases patients' seizures were exacerbated. We hypothesize that these newer AEDs are not effective in large number combinations with other AEDs. Therefore, we assume that the reduce number of oral AEDs in any combination is important in using these newer oral AEDs effectively. Thus we try to reduce oral AEDs under intravenous (IV) AED.
Subjects and methods: We evaluated results gathered from 46 epileptic patients enrolled for this study. They ranged in ages of 3-12 years old, and all patients were suffering from reduced quality of life from seizures. All were admitted to our hospital (UOEH) from 2010, and written consent for their participation from each patient's parents was obtained.
Patients were being treated with differing combinations and numbers of between 2-6 oral AEDs. Before our reduction experiment, patients were suffering between 1-50 seizures a day. To evaluate what kind of IV AED was effective, we recorded patients' EEG simultaneously when we administered IV AED. If patients' EEG worsened, we did not select that IV AED. During our reporting period, 5 patients were eliminated from this experiment because their EEGs did worse after IV AEDs. We used (i.g,) midazolam for 0.1 mg/kg/hr. After approximately one week, each patient's regimen was reduced to one single AED and all others were removed from that patients regimen. Next, midazolam was also gradually reduced. From this point, we began to carefully add a newer AED. If the patient fell into seizure, we evaluated that its efficacy was not effective of those

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simpler combinations.
Results: We show the results from 41 patients. After adjustment, AEDs were reduced to combinations of only 2-3 and seizure frequency was also reduced to 1-10 per day. The mean hospitalization time was 14-65 days. We could significantly reduce the number of AEDs ($p < 0.001$) and patient seizure frequency ($p=0.001$). No patient suffered from status epilepticus or serious side effects during IV AED adjustment trials.
Conclusion: Our study is the first report we know of that looks into the results before adding a newer AED, reducing the number of oral AEDs is important for efficacy. Further, reduce the number of oral AEDs under IV AED application is safety.

Prognosis

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Clinical characteristics and prognostic factors of unstable epilepsy
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Purpose: Various clinical predictors has been studied for patients with refractory epilepsy. However, there is a proportion of epilepsy patients who are seizure free initially but then have a progressively increasing number of seizures or fluctuating clinical course. This study´s objective is to investigate characteristics and predicting factors, those associate with epilepsy with this unstable clinical course.
Method: We included 279 records from 480 records of epilepsy patients that had been followed up at Epilepsy Clinic at Siriraj hospital between 2003 and 2012. Clinical characteristics and clinical course were reviewed. Patients were then allocated into stable, unstable, or refractory epilepsy group. The association between different factors and clinical outcome patterns were explored using univariate and multivariate analysis.
Results: Mean age at onset was 33.3 years old. Almost all patients included had localization-related epilepsy (274/279; 98.2%). Allocation resulted 101 seizure free, 65 stable, 86 unstable and 27 refractory epilepsy patients. On multivariate analysis, the older age of epilepsy onset of epilepsy was associated with lower risk of unstable epilepsy (OR 0.967/year of age added, p-value 0.000). Female sex (OR 2.011, p-value 0.020) and presence of multiple types of seizures (OR 3.950, p-value 0.000) were associated with increased risk of unstable epilepsy. The age of epilepsy onset (OR 0.979/year of age, p-value 0.000), female sex (OR 2.277, p-value 0.013), presence of multiple types of seizures (OR 4.014, p-value 0.001) and focal epileptiform discharge on EEG (OR 2.001, p-value 0.044) were also associated with increased risk of epilepsy with poor clinical outcome (patients in unstable epilepsy and refractory epilepsy groups).
Conclusion: The specific predictors revealed in this study may help us answer patients' questions regarding their future prognosis and help with subsequent clinical decision. The patients with predictors described above, probably have more guarded prognosis, although they may initially response to treatment.

p272
Outcome of acute symptomatic seizure at emergency department in Cipto Mangunkusumo Hospital June 2013 - January 2014
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Purpose: To assess the outcome in patient with acute symptomatic seizure at emergency department in Cipto Mangunkusumo Hospital from Juni 2013 to January 2014.
Method: This was a retrospective descriptive study which data was taken from medical record. Inclusion criteria: all patients with acute symptomatic seizure in the emergency department. Exclusion criteria: patients with age below 18 years old, patients that has been diagnosed with epilepsy and under medical treatment with antiepileptic drugs. All patients had been observed up to 3 days in emergency department. The outcome that measured was death and alive.
Results: Thirty one patients were recruited. The means of age was 45.35±16.881 years old. Seventeen patients (54.8%) came with GCS score more than 12. There were 14 patients (45.2%) with generalized seizures dan 17 patients (54.8%) with focal seizures. Twenty patients (64.5%) did not have focal neurological deficit. There were seven patients (22.6%) that died which all of them have generalized seizure. Among the group of patients who died, five patients had metabolic abnormality as the underlying disease. From the data analysis, GCS, focal neurological deficit and intracranial lesion as the underlying disease had no significant relationship with the outcome of all patients. Patients with generalized seizure had tendency to have poorer outcome than the patients with focal seizures (p 0.001; OR 2.000; CI 95% 1.185-3.377).
Conclusion: In this study, patients with generalized seizure had tendency to have poorer outcome than patients with focal seizure. Most of the patients who died had metabolic abnormality as the underlying disease. There was no significant relationship between the GCS score, focal neurological deficit and intracranial lesion as tha underlying disease with the outcome.

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Early-onset seizures are correlated with late-onset seizures in children with arterial ischemic stroke

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Purpose: Early-onset seizure is one of the common features in children with arterial ischemic stroke (AIS), but the clinical features and effects on outcome of early-onset seizure were less studied in children. Therefore, in this retrospective analysis, we aimed to evaluate the epidemiology of early-onset seizure after AIS in children, and to determine their effect on outcome and their treatment.
Methods: Children aged 1 month to 18 years presenting with first-time and image-confirmed AIS between January 1995 and December 2010 were identified from the database of National Taiwan University Hospital. Clinical data were abstracted and analyzed.
Results: Total 89 cases of AIS were enrolled for analysis. Of these, 25 (28.1%) had early-onset seizures. Early-onset seizures occurred as initial presentation in 84% of these children. Children with younger age (mean: 3.9±4.0 years vs. 9.0±6.2 years, P< 0.001) and with cortical involvement in AIS (96% vs 68.8%, P = 0.005), are more likely to have early-onset seizure. Thirteen (65%) of 20 survivors with early-onset seizure had late-onset seizures after acute stage, and 12 (92%) of them were finally diagnosed to have post-stroke epilepsy.
Conclusions: Early-onset seizures occurred in 28.1% of children with AIS. Younger age and cortical involvement were risk factors for early-onset seizures. Sixty-five percents of children with early-onset seizures would have late-onset seizures after acute stage.

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Psychiatry

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Acupuncture prevention for depression with epilepsy patients

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Purpose: The goal of the work described in this study was to observe the prevention effect of acupuncture for depression with epilepsy patients.

Method: Diagnosed epilepsy patients (25 cases) were screened for depression. The risk for depression was increased 20 patients who were randomized into two equal treatment groups: (1) Acupuncture group and (2) Non-Acupuncture group. The Center for Epidemiological Study on Depression (CES-D) scale, Hamilton Depression Scale (HAMD), and Quality of Life in Epilepsy Inventory (QOLEF-31) were administered at before and after treatment period.

Results: In our study after Acupuncture treatment were found to be the decreased risk factor for depression and increased occupational/social acidity and Quality of Life.

Conclusion: Depression in patients with epilepsy is serious medical and social problem since it afflicts almost one half If all patients treated in epilepsy referral centers. Acupuncture treatment reduces for depression for epilepsy patients and help them occupational and social activity.

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Evaluation of pharmacotherapy for developmental disorders with EEG abnormality

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Purpose: Children with developmental disorder often suffer from epilepsy and paroxysmal EEG abnormality. In pharmacotherapy for developmental disorder, not only anti-psychotic drugs, a combination of anti-epileptic drugs have an effective for behavioral and psychiatric symptoms in many cases. Evidence of pharmacotherapy for developmental disorder associated with abnormal EEG has not been established. Purpose of this study is to evaluate the usefulness of anti-epileptic drugs in developmental disorder, which showed EEG abnormalities with or without clinical epileptic seizures.

Method: A total of 125 patients of developmental disorder (autism spectrum disorders: ASD, attention deficit hyperactivity disorder : ADHD, intellectual disability: ID), who have been treated and followed-up at our outpatient hospital (from 3 to 28 years, mean age 13.5 years) were included in this study. Each participant´s EEG had been recorded approximately every 6 months under sleep conditions. We examined for the drug´s therapeutic effect including of behavioral and psychiatric improvement to anti-epileptic drugs.

Results: EEG abnormalities were present in 76.0%, epilepsy were complicated in 55.0% of ASD. EEG abnormalities were complicated in 75.0%, epilepsy were complicated in 25.0% of ADHD. All patients showed EEG abnormalities on frontal area. Although, there is no statistically significant difference in the effectiveness of anti-psychotic drugs or anti-epileptic drugs, all patients treated with both combined drugs were more improved.

Conclusion: Anti-epileptic drug is effective in developmental disorder who had EEG abnormalities even though without clinical epileptic seizures. In the cases of poor effect with anti-psychotic drugs associated with EEG abnormalities, anti-epileptic drugs may be an alternative treatment in developmental disorder. It is necessary to review by the quantitative behavioral and EEG assessment after treatment of anti-epileptic drugs as an issue in the future

by prospective intervention.

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Screening for autism by SRS in children with epilepsy

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Purpose: We aim to investigate the proportion of children who combined with autism among children with epilepsy, and identify the differences in the clinical features among the two groups of patients.
Method: We recruited 75 children with epilepsy in the epilepsy center of Children's Hospital of Fudan University, China. Parents of the patients (aged 4-18 years old) were required to complete the Social Responsiveness Scale (SRS), and their demographics, EEG feature, age of onset and classification of seizures, IQ, MRI/CT, as well as gestational outcomes were collected.
Results: A total of 75 patients were screened between September and November 2013. Data of SRS screen tests from the rest of 69 parents were collected, 6 parents failed in providing their questionnaires. The mean age of patients at screening was 8.6 years, and 42 (42/69, 61%) of the children were boys. 11(15.9%) children with epilepsy had positive results in SRS screening, 9(13%) children had borderline results. Abnormal scores of SRS were highly correlated with socialization and communication deficits., the following factors, EEG showed focal epilepsy wave such as over 35 years old at pregnancy, male gender, early onset of seizures(< 2yrs), abnormal brain MRI results, mental retardation, and refractory epilepsy, were significantly associated with an higher screening score compared with patients who without these clinical characteristics.
Conclusion: The preliminary results of the study show that 16 % of the children with epilepsy have positive screening results; autism-like behaviors seem to be a feature of children with epilepsy. The results from this study suggest that routine screening for autism in children with epilepsy may ensure early diagnosis of autism in this high-risk group, followed by definitive autism tests in those with abnormal screening score, will help to achieve early intervention, obtain better prognosis and improve quality of life for children with epilepsy.

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Clinical features of psychogenic nonepileptic seizures

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Purpose: This article describes the clinical features of psychogenic nonepilepticseizures (PNES) in people in southwest China.
Method: Patients with a confirmed diagnosis of pure PNES by video/ Electroencephalography monitoring were retrospectively reviewed.
Results: A total of 23 patients with PNES were included, 14 (60.87%) of whom were female. 8 (34.78%) patients had previously been misdiagnosed and treated for epilepsy. Psychological trauma and head injuries were considered antecedent traumatic factors. A history of abuse was rare.The PNES cases were divided into three subtypes: psychogenic minor motor seizures, psychogenic major motor seizures, and unresponsive seizures. Age at onset was identified as a predictor of prognosis.
Conclusion: The results of this study demonstrated a higher prevalence of PNES in females compared with previous studies. The semiology of PNES in China is similar to that in Western countries. Classification of semiology may be helpful in the differential diagnosis of PNES.

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Seizure semiology

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Late-onset spasms: our experience in 10 Japanese symptomatic cases

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Purpose: Late-onset spasms (LOS) are defined as epileptic spasms starting after the first year of life. The aim of this study was to reveal the clinical features of LOS.
Methods: We reviewed the clinical manifestations, MRI, EEG, and outcomes in patients with LOS whose diagnoses were confirmed by video EEG at our center between 1999 and 2013.
Results: Ten patients (8 males) were identified with LOS, and all were classified as symptomatic (post-encephalitis/encephalopathy 4, cerebral palsy 1, MCT8 transporter deficiency 1, Sotos syndrome 1, and unknown etiology 3). Before onset of spasms, 9 patients showed developmental delay, and 7 developed other types of seizures (mean age 2 years 10 months). The age at spasms onset ranged from 2 to 9 years (mean 3 years 1 month). EEG at spasms onset revealed hypsarrhythmia in 2 patients, multifocal spikes in 4, localized or lateralized abnormalities in 2, and diffuse abnormalities in 2. Two patients had normal MRI findings. Four patients exhibited intellectual deterioration after onset. Only 5 patients had experienced cessation of spasms with antiepileptic drugs (efficacy rate: CLB 2/7, GBP 1/5, VPA 2/10, TPM 0/9, LTG 0/10, LEV 0/10) and/or ACTH therapy (2/5). However, all patients who responded to medical treatment had a recurrence of seizures (spasms 3, partial seizure 1, and spasms plus partial seizure 1) within 1 month to 4 years after cessation of spasms. After seizure relapses, 2 patients underwent neurosurgery (VNS in 1, corpus callosotomy in both). At the final evaluation (mean age 10 years 4 months), only 1 patient who underwent corpus callosotomy subsequent to VNS had achieved seizure control for 12 months. Three patients evolved to Lennox-Gastaut syndrome. The remaining 6 patients had persistent spasms.
Conclusion: This study revealed that both antiepileptic drugs and ACTH therapy have limited effectiveness in the treatment of symptomatic LOS.

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Semiologic charateristics of convulsive syncope: head-up tilt tests with video monitoring

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Purpose: Syncope with convulsion can be confused with epilepsy. We aimed to demonstrate the semiologic signs during the syncopal attack and to characterize eye signs of syncope.
Method: We applied head-up tilting table test (HUT) and video recording simultaneously, which includes another video setting for eye observation. We investigated the video of the patients with positive results and syncope during HUT, especially focusing on the convulsive features and eye ball deviations. Furthermore, we estimated a certain correlation between these semiologic findings and the hemodynamic changes including heart rate and blood pressure.
Results: Of 541 patients with positive HUT, 84 (15.5%) patients experienced syncope during the test. Among these syncope patients, 49 (58.3%) patients showed eye opening with eyeball positioning or movements during the syncopal attack. Out of eyeball manifestations, conjugate eyeball deviation to upward in 35 patients (41.7%) is common position. Twenty four (28.3%) patients revealed head drop. Forty four (52.4%) patients showed seizure mimicking movements

in their arms or legs, including myoclonic, tonic, or clonic phase. Interestingly, patients with head drop and eye opening showed significant decrease of systolic blood pressure and heart rate during syncopal attack (p=0.031).
Conclusion: Our results provide that head drop with eye opening state during syncope can be the sign of more profound degree of cardiohemodynamic dysfunction.

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Postictal language testing in temporal lobe epilepsy
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Purpose: Postictal language testing can provides useful diagnostic information for seizure lateralization. However no such study based on non-English language was done previously. Here we investigated the latency of language recovery in Chinese patient with temporal lobe epilepsy (TLE).
Method: Complex partial seizures in patients with TLE were extracted from our video-EEG database. For all patients, consciousness testing started as soon as seizures were detected. When they were alert and cooperative, they were asked to read out a sentence which was printed on a card. When the patients were able to read the sentence correctly, the language function was considered recovered.
Results: Totally 65 complex partial seizures from 22 cases of TLE (11 left and 11 right) were included. Patients were cooperative to language testing in 54 seizures (83.1%). The latency for consciousness recovery (CRL) and latency for consciousness language recovery (LRL) were not associated with seizure duration, but the seizure lateralization. The CRL (median, 161s) and LRL (281s) in the left TLE were statistically significantly longer than that in the right TLE (30s, 54s respectively). Using 150s cutting off time, language recovery ratio was 87% (27/31) in Right TLE and 13% (3/23) in Left TLE.
Conclusion: Postictal language testing based on ideographic Chinese words helps to seizure lateralization in temporal lobe epilepsy.

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Semiological features do not differentiate mesial temporal lobe epilepsy with hippocampal sclerosis (mTLE-HS) from other causes of temporal lobe epilepsy
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Purpose: Mesial temporal lobe epilepsy with hippocampal sclerosis (mTLE-HS) has been long recognized as a distinct syndrome. A number of patients with refractory temporal lobe epilepsy (TLE), however, have a spectrum of etiologies and localization within the temporal lobes. Clues from history that may help differentiate the former from all other patients with TLE could be very useful for early differentiation of the two entities. This study aims at comparing clinical semiological features of seizures reported by patients with mTLE-HS versus others with TLE.
Method: Charts of consecutive patients attending our Intractable epilepsy clinic, over a period of 6 months, diagnosed clinically as TLE, were reviewed. All patients had been evaluated through a structured evaluation performa and a dedicated MRI and EEG evaluation. Seizure semiology features were tabulated for patients with mTLE-HS versus the rest, and analyzed for statistical or clinical significance.
Results: A total of 53 patients were analyzed. mTLE-HS group was comprised by 15 patients,

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while 38 fell in the other group.No difference was found between both groups, in the percentage of patients reporting aura of epigastric rising sensation (33 v/s 23%), fear (2 v/s 3%), dizziness, de´ ja` vu or other experiential phenomena (1% v/s 1%), auditory (0% v/s 5.26%), gustatory or olfactory hallucinations (p >0.005). Similarly, both groups had equal number of patients with dyscognitive seizures (53% v/s 57%), ictal speech(6.6% v/s 8%), unilateral dystonic limb posturing (20% v/s 23%) as well as ictal coughing, vomiting and spitting. The mTLE-HS group had a higher percentage of patients with distal limb and orofacial automatisms (47% v/s 31%), however, this difference too did not reach statistical significance.
Conclusion: This study demonstrates that classical temporal lobe semiological features occur with almost equal frequency among patients with mTLE-HS as well as patients of TLE with other etiologies and localizations.

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Predictable temporal sequencing of three distinct seizure semiologies in a patient with partial epilepsy - a case report
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Purpose: To report a very unusual case of partial epilepsy with predictable temporal sequencing of three distinct seizure semiologies.
Setting: National Epilepsy Centre (NEC) is a tertiary care centre designated for epilepsy management in Karachi, Pakistan's largest cosmopolitan city with a population of ~ 20 million. NEC has 6150 registered patients, with an average of 900 new patients from different parts of the country getting registered annually.
Case history: A nine year old female child presented with history of seizures since the age of 2.5 years. The seizure type was partial with secondary generalization and of three distinct semiologies. The unique feature of these seizures was the predictable temporal sequencing without any change in their order. Seizure type 1, 2 & 3 always occurred during weeks 1, 2 & 4 respectively of each month. In week 3 the patient would be seizure free. This unique temporal sequencing was ongoing since two years.
On investigating she was found to be having a space occupying lesion in the right parieto-occipital region. With adequate medical and surgical therapy the child has been seizure free since 1.5 years.
Conclusion: A case of partial epilepsy with very unusual predictable temporal sequencing of seizure types in an 11 years female child is being reported. A detailed literature search did not reveal any other report with such presentation.

Social issues

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Memory and epilepsy: what factors determine the severity of memory decline in epileptic patients?
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Purpose: To assess rates of memory loss in epileptic patients, and identify potential trends.
Method: A cross-sectional study involving 47 patients aged 16-68, known to have epilepsy. While attending out-patient epilepsy clinics in two district general hospitals, subjects completed 2 memory assessments: one objective (TYM), one subjective (ABNAS).

Results: The data showed statistically significant correlation between the TYM and the ABNAS scores. Lower TYM scores were seen if patients were on multiple drug therapy, or if their seizure frequency was greater.
Conclusion: A patient's subjective account of their memory loss does correlate with their score on an objective assessment tool. The greater the number of anti-epileptic medications a patient was taking, the greater the severity of memory impairment. Furthermore, patients taking Carbamazepine scored lower objectively. Larger numbers are required to support this trend further, so that patients at increased risk of these side effects can be warned accordingly.

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Driving among epilepsy patients in West China
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Purpose: To survey the driving status of PWE in West China and to explore the socio-demographic and clinical factors associated with driving.
Methods: Between October 2012 and October 2013, all adult patients who came to our epilepsy clinic in the West China Hospital were invited to participate. Logistic regression was used to detect the patient factors associated with driving.
Results: A total of 657 patients completed this study. We found that 128 (19.5%) of these patients had driven recently (during the past year); among them, 80(62.5%) experienced at least one seizure in the previous year. A logistic regression suggested that being male, being younger than 50 years old, married, having a higher personal income, experiencing no seizure while awake and taking fewer antiepileptic drugs were independently associated with recent driving.
Conclusion: This study showed that a considerable proportion of patients continue driving despite uncontrolled seizures. More detailed and operational driving restrictions may be needed for patients in China in order to strike a better balance between patients´ quality of life and public safety.

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Prevalence of violence in people with epilepsy
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Purpose: The violence related to epilepsy can occur due to the situation of the disease or emotional problems when a patient has to cope with epilepsy as a chronic illness.The study surveyed the prevalence of violence problems in people with epilepsy, characteristics of violence and the health consequences.
Method: The 350 persons making up the sample were out patients with a diagnosis of epilepsy at Srinakarind Hospital's epilepsy clinic.Data were collected throughout January 2013 to July 2013 by self questionnaire. It was used to ask 17 people with epilepsy for reliability by Cronbach's alpha at 0.86 .The data were analyzed by frequency, percentage , Pearson correlation.
Results: The results revealed that there were 206 females (59.7%) and 141males (40.3%), aged 18 - 85 years. Most were 20-30 years of age (90 patients, 17.1%), mean 31.1 years. The prevalence of violence to others was 51.4% (180), of being recipients of violence was 40.0% (140). There was significant correlation between being the recipient of violence and being the perpetrator ($r= 0.58$, $p < 0.001$). They used violence and were victims of violence as per, emotional (45.1%,34.3%), physical(21.4%,19.4%), property(12.1%,7.7%),and sexual violence(3.2%,2.9%)

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.Most victims were partners but perpetrators of violence were other persons not family members, partner, sibling, or parents. The top 6 consequences were feelings of guilt towards the behavior 71.6%, suffering 59.7%, anxiety 50.2%,depression and boredom, detached 38.8%, dissatisfaction with interaction among family members 31.3% and unhappy with family life 30.8%.

Conclusion: The patients with epilepsy were victims as well as perpetrators of violence. There were consequences to the individual, family and community. They needed nursing care to control violence prevalence and to reduce the effects of violence. They wanted to control their emotions and aggressive behavior to prevent and help them to manage violence.

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Quality of life in adolescent absence epilepsy in Queen Sirikit National Institute of Child Health

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Purpose: To compare the Quality of Life (QoL) between adolescent with absence and the other types epilepsy.

Method: A prospective cohort study was conducted in adolescent age 10-18 years old that had been diagnosed with epilepsy at QSNICH since 2000 to 2012. QoL was assessed using the QOLIE-AD 48 Thai version.

Results: A total of 73 adolescents were included of which 27 had absence epilepsy. The mean total QOLIE-AD 48 score was 63.94(17.14). The absence group had a mean score of 74.45(9.83) while non-absence group had a score of 57.78(17.57); which were statistically significant. ($P < 0.001$).

Conclusion: The QoL of adolescents with absence epilepsy is significantly better than those suffering with other types of epilepsy.

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Pilot study on the impact of outpatient epilepsy medication review in a paediatric population

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Purpose: To identify drug-related problems (DRPs) of epilepsy patients and to understand the caregiver's perception of pharmacist-aided structured medication review in the management of their anti-epileptic drugs (AEDs).

Method: Prospective observational study of pharmacist-aided structured medication review. Candidates were selected from a convenience sample of children with epilepsy attending routine outpatient epilepsy clinic appointments. Children were selected based on history of multiple medications and a structured review of their medication history. Patient's AED regimen, compliance to the prescribed AEDs and other drug related issues were reviewed. The caregivers completed a demographic form and a service satisfaction survey. DRPs were identified and classified using a modified version of the Pharmaceutical Care Network Europe (PCNE) Foundation Classification for DRPs.

Results: Thirteen children with epilepsy aged between 3 months and 21 years old were recruited over a 7-week period. All children were under follow-up at the epilepsy clinic at KK Women's and Children's Hospital.The median number of prescribed AEDs for each patient was 3 (range = 1 - 4). The main caregivers of the children were mostly their parents (67%). A total of 21 DRPs were identified, each patient has at least 1 DRP. Interventions/recommendations were made for each DRP. Three DRPs were completely resolved on site. Only 1 intervention/recommendation did not

require any follow-up. After the follow-up session, 12 (57%) more DRPs were resolved while 2 (9.5%) DRPs were partially resolved and required further follow-up. Three caregivers rejected the advised interventions/recommendations and DRPs persists. Most of the caregivers (67%) agreed that the review was beneficial and 80% of them agreed that the review provided opportunity for doubts to be cleared.
Conclusion: Structured epilepsy medication review can reduce DRPs of children with epilepsy. Single time-point interventions are of limited utility and longitudinal support may be required to obtain efficacy of the intervention.

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Epilepsy treatment gap in India - Can epilepsy educators make a difference?
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Purpose: Untreated epilepsy is a major problem in India. There are 10-12 million Indians who have epilepsy and approximately 1247 neurologists struggle to treat them.Patient education is critical in epilepsy management, yet epilepsy educators are rarely available and this aspect is largely ignored. We are working to address this educational gap and demonstrate usefulness of Epilepsy Educators (EE) for a rural and semi-rural population.
Method: This retrospective review is from an ongoing outreach epilepsy clinic on the Lifeline Express - a hospital in a train (a project of Impact India Foundation) that travels to different rural locations in India. Knowledge and information gaps previously identified are addressed through group talks on epilepsy and first aid; individual counseling; explaining prescriptions, adherence and discussing psychosocial issues. Fact sheets on epilepsy and first aid in the local or national language are provided. Explaining prescriptions using illustrations and instructions written in Hindi is a critical component of the service. A questionnaire is used to record patient profile, document issues discussed and to obtain feedback.
Results: A total of 364 patients have been seen by educators. 175 (48%) had not been on treatment prior to the clinic visit. Besides freeing the neurologist's time for patients, some specific areas in which EEs made a significant difference were:
- Explaining the importance of treatment, continuity and adherence.
- Identifying PWE with co-morbid depression.
- Identifying abandoned women and children removed from school because of seizures.
- Addressing wrong practices in first aid.

Illustrative cases will be presented.
Conclusion: Epilepsy educators are crucial especially in illiterate or semiliterate populations that do not have access to information by other means. Making epilepsy educators more widely available will have a significant impact on improving epilepsy care in India.
Acknowledgement: The 18th IEC Trust of the Indian Epilepsy Association has funded Epilepsy educators in this project.

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Exploring the experiences and needs of people bereaved by epilepsy: results from an online Australian survey
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Purpose: The aim of the study was to explore the experiences and needs of bereaved family and

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friends prior to and following an epilepsy related death in Australia.
Method: We analysed data from an online survey, completed by adults who have lost a family member or friend through an epilepsy-related death in Australia. The 28-question electronic survey, advertised by state and national epilepsy associations and research registers, was available between July 2012 to October 2013. Quantitative data was analysed using SPSS20, with qualitative comments imported into NVivo10 where each response was read, discussed and coded collaboratively by two researchers. Ethics clearance was obtained from the Flinders University Social and Behavioural Research Ethics Committee (5658).
Results: A total of 101 valid Australian responses were received, providing insight into the demographic details of the person with epilepsy, epilepsy status and treatment, time since the death, satisfaction with services providers involved at the time of death, follow-up support received, perceptions on how well the death was explained, and gaps in service or support. The largest group of respondents were parents (48%), with the mean age at death 31.6 years. Of note, 52.5% indicated that prior to the death, they did not know people could die because of epilepsy. Comments were coded under two main themes describing recommendations for services and supports which should be available prior to and following the epilepsy related death.
Conclusion: Findings indicate many family and friends were not aware of the risks of epilepsy related deaths. In spite of increased acknowledgment by medical professionals to discuss risks, there is need for further information and open discussion on epilepsy-related death (particularly SUDEP), and increased access to appropriate grief and loss support and counselling, peer support for bereaved family and friends, and follow-up from health professionals and other services.

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Factors affecting quality of life among members of Yayasan Epilepsi Indonesia (Epilepsy Association of Indonesia)
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Purpose: Quality of Life (QoL) is related into overall aspects of human life such as, physical health, psychological health, and also social aspects. It is also applied for People with Epilepsy (PWE). There are several things that related into QoL in Epilepsy, such as physical factors (e.g. seizure frequency, seizure effects, side effects of AED, physical condition, cognitive ability, memory), psychological factors (e.g. worries to get seizure in public area, mental condition), and also social factors (e.g. opportunity to studying/working, opportunity to get along into community, family-friend-public support, epilepsy community). The purpose of this study is to understand which one of these 14 factors that most influence QoL in Epilepsy.
Methods: Respondents of this study are 38 PWE that were recruited from Yayasan Epilepsi Indonesia. Profile these 38 PWE are male (55%) and female (45%), with average of age is 26, and coming from greater Jakarta. QoL in epilepsy were measured by using pen and paper questionnaire in face to face interview. Fieldwork interview were conducted in January to March 2014.
Results: From regression analysis we find that all these 14 factors significantly influence and can predicted QoL in epilepsy ($r=0.867$; $p< 0.01$). Among these 14 factors, looking at percentage of contribution in predicting QoL in epilepsy, we find the Top 5 factors that have the strongest contribution. These top 5 factors are: epilepsy community (18%), friends support (12%), cognitive ability (10%), seizure effects (10%), and public response (9%). From the open end question, most of respondents mention about added value in joining epilepsy community such as finding more information about epilepsy, getting support from all members, and learning how to do normal life with epilepsy.

Conclusions: Physical, psychological, and social aspects significantly influence and can predicted Quality of Life in epilepsy.

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Quality of life in epilepsy: the role of family and social support

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Purpose: Quality of life (QoL) is an important health care outcome for People with Epilepsy (PWE). The purposes of this study is to monitoring QoL in epilepsy during 2012 to 2014, and also find key points to optimizing QoL in epilepsy.
Methods: Previously, we already have data of QoL study in 2012 from 32 PWE that also member of Yayasan Epilepsi Indonesia (YEI). Then we recruit 38 PWE from YEI to be respondents of QoL study in 2014. Profile these 38 PWE are similar as respondents in 2012, which male (55%) and female (45%), with average of age is 26, and coming from greater Jakarta. QoL in epilepsy were measured by using pen and paper questionnaire in face to face interview. Fieldwork interview were conducted in January to March 2014.
Results: QoL was measured by 7 points scale. From t-test analysis we find that there are significance difference between mean score of QoL in 2012 and QoI in 2014 (t score = 3.51; $p < 0.01$). Mean score of QoI in 2014 (5.158) is significantly higher than mean score of QoL in 2012 (4.031). From open end questions, we find that in 2012 most respondents mention about negative response in community, working with epilepsy, also negative impression of epilepsy in public area. While in 2014 most respondents mention about family support, social support, find a just right job, and daily routine activity. Looking at correlation analysis, we also find that there are significant positive correlation between QoL and Epilepsy community ($r=0.49$; $p < 0.01$), Friend support ($r=0.61$; $p < 0.01$), Family support ($r=0.55$; $p < 0.01$), Opportunity in studying/working ($r=0.53$; $p < 0.01$).
Conclusions: QoL in 2014 is significantly higher than QoL in 2012. From the point of view of PWE, the key points to optimizing QoL in epilepsy are family and social support.

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People knowledge, perception and attitude toward epilepsy (a mixed method study)

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Purpose: This research aimed to describe knowledge, perception and attitude toward people with epilepsy (PWE) in Indonesia, especially Jakarta, so that subsequent education and information effort on epilepsy as part of a comprehensive management goal can be effectively done.
Method: This was a mixed quantitative and qualitative study with embedded design. The quantitative study used the cross sectional design to describe knowledge and attitudes toward epilepsy and the factors that influence it. The qualitative study used grounded theory design, which aim to determine the perception underlying the negative attitude toward epilepsy
Results: Most respondent showed good and moderate level of knowledge about epilepsy. People with moderate and low level of education, socioeconomic level below the poverty line, unemployment and certain ethnic group showed more negative attitude towards epilepsy. People objected to marry or to permit their children marrying PWE. If they wanted to give permission, they do so unwillingly. People were uncomfortable to work with PWE and they objected to hire them. If they wanted to hire PWE, they would do it with much consideration. Our society still adopt stigma about epilepsy and was uncomfortable to socialize with PWE

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Conclusion: Knowledge and attitudes towards epilepsy was influenced by certain demographic factors. Stigma of epilepsy is still common among our society, affected social relationships, marriage and employment among PWE.

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To assess the knowledge level on epilepsy and its treatment among the newly joined nursing students in Madurai, India

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Purpose: To know the level of knowledge on epilepsy.to addresses the appropriate education system among the HCP's.To design a community health intervention system as harmness minimization.

Method: Design-Descriptive designSampling- Simple random sampling. Sample size-150 respondents. Unit and universe- newly joined students nurses studying first year in three college in Madurai ,Tamil Nadu India.

Results: The major research findings were, 78percent of them feels that epilepsy means violent shaking and loss of alertness..22percent says that there are no symptoms in epilepsy. Only 65percent of the student's respondents knew that epilepsy is due to the dysfunction in the brain. The remaining 35percent of them says that it is problem in the physical condition.12percent of the respondents says that epilepsy is affected due to lack of nutritious food of thechildren.35 percent of the respondents says that it is due to lake of antenatal care of the mothers,35 percent of the respondents says that the treatment of epilepsy is costly.65 percent of the respondents says that government is providing free treatment for epilepsy.

Conclusion: In India Knowledge level on epilepsy and its treatment facilities are very difficult to identify we have to do a lot of research in the field. Indigenous health system, Stigma, and myth and misconception are the threatening factors to increase the prevalence rate among the community. At present, only 15 percent of the patients coming for modern treatment. In particular in rural areas only 12percent of them are taking treatment.

Noncompliance of treatment, Dearth in the health care system and the level of KAP among the health care providers are the leading causes for the increasing the prevalence rate among the rural girl children. The researcher wanted to address the level of knowledge among the first year nursing college students in order to impart the right education.

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Quality of life predictors in patients with epilepsy and cognitive problems

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Purpose: We aimed to assess QOL and its predictors in Bulgarian patients with refractory epilepsy (RE) and cognitive problems.

Method: We conducted a study based on questionnaires designed for people with intellectual disability (stigma scale, Glasgow Depression Scale, Glasgow Anxiety Scale, Glasgow Epilepsy Outcome Scale - GEOS-35) and a purposeful interview on clinical and social factors of 64 patients (50% men) with RE and cognitive problems.

Results: The mean total score of GEOS-35 was 76 ± 2.34 (an indicator of low QOL). On univariate analysis GEOS-35 total score was associated with seizure frequency and severity, stigma, depression, and anxiety. On multivariate regression analysis predictors of GEOS-35 total score were anxiety, seizure severity, and stigma $P < 0.001$ ($F = 14.66$). Regarding GEOS-35

subscales, on multivariate regression analysis we found: 1. Seizure severity, seizure type, and anxiety were predictors of "concerns about seizures" $P < 0.001$ ($F = 8.99$); 2. Anxiety was the only predictor of "concerns about treatment" $P < 0.001$ ($F = 7.98$); 3. Anxiety and seizure severity were predictors of "concerns about caring" $P < 0.001$ ($F = 12.12$); 4. Seizure severity and stigma were predictors of "concerns about social impact" $P < 0.001$ ($F = 18.31$).
Conclusion: We have affirmed low QOL in patients with RE and cognitive problems and its clinical and social determinants. The results from our study prove the necessity of a multidisciplinary approach for quality of life improvement in these patients.

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The effect of epilepsy on the risk of traffic accidents
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Purpose: Epilepsy is a brain disorder that causes people to have recurring seizures. The seizures happen when clusters of nerve cells, or neurons, in the brain send out the wrong signals. People may have strange sensations and emotions or behave strangely. They may have violent muscle spasms or lose consciousness. Epilepsy make some. A person with a seizure disorder that causes lapses in consciousness may be putting the public at risk from their operation of a motor vehicle. Not only can a seizure itself cause an accident, but anticonvulsants often have side effects that include drowsiness. People with epilepsy seems to be more likely to be involved in a traffic accident than people who do not have the condition. To test this hypothesis, we designed a case-control study in which 50 epileptic patient and 50 normal person were selected who all were derivers.
Method: Sampling process was person to person and all the samples received standard Questionnaires.
Results: The results shows that the epileptic patients had 2.5 times more accidents in comparison with normal people. Also more than 70% of the accidents in people with epilepsy was not due to epileptic attack episodes. About 60% of the patients had general seizures at the accident's moment. None of the cases had informed the police about their problem when they had received their driving license.
Conclusion: Our results indicate that there is a significant difference in the rate of traffic accidents in the patients with epilepsy.

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Factors affecting employability among people with uncontrolled seizures
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Purpose: Obtaining and maintaining a job remain difficult among epileptic person. However, there are individuals have successful employment despite having uncontrolled seizures. This study aimed to explore positive and negative factors affecting the employability in patients with uncontrolled seizures.
Method: Semi-structured interviews of 21 persons with uncontrolled seizures from Neurology outpatient clinic at University of Malaya Medical centre were conducted. Data were analyzed using thematic analysis.
Results: Eleven (52.4%) of the participants interviewed were employed; 9 were holding a full-time position and 2 with part-time job at the time of interview. The mean age was 34.6 years, 71.4%

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female, 38% married, 71.4% with at least 11 years of education, 66.7% had seizure onset before 17 years old and 66.7% experiencing monthly seizures. There were no significant differences in gender, education level, marital status, ability of traveling alone and motivation regulators between the employed and the unemployed groups. A total of 9 main themes were found affecting the employability: ability to work, intention to work, psychological factors, medical factors, demographic factor, support and stigma in workplace, family support and protection, employment related life event and religion. Almost all participants perceived that they have the ability to work and a majority reported that they could continue working after a seizure attack at workplace. Inability to drive among respondents did not deter them from travelling independently, often with the assistance of public transportation.
Sub-analysis of the theme "intention to work" showed that employment was a major contributing factor influencing self-determined motivation.
Conclusion: There were positive factors affecting employability among those with uncontrolled seizures. Self-determined motivation appeared to be a possible determinant.
This study was sponsored by a High Impact Research Grant, a governmental research fund (Reference no: UM.C/HIR/MMOHE/ED-08).

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Excessive daytime sleepiness in epilepsy patients at outpatient clinic Cipto Mangunkusumo Hospital Jakarta

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Purpose: Sleepiness is a common complaint of people with epilepsy and frequently attributed to antiepileptic drugs and seizures. The main objective of the study was to evaluate excessive daytime sleepiness (EDS) in epilepsy patients at outpatient clinic at Cipto Mangunkusumo Hospital Jakarta.
Method: A cross sectional study with subjects consisted of 35 consecutive adult patients with partial epilepsy was performed. Antiepileptic drugs (AED), number of AED, seizure frequency were recorded. Patients were asked to fill Epworth Sleepiness Scale Questionnaire (ESS). EDS was determined if ESS score > 10.
Results: EDS was found in 20% (7 of 35) patients. All of 14% patient with uncontrolled seizure had ESS score < 10. Regarding of AED numbers, 57.14% patients received monotherapy, while 42.85% patients with polytherapy. About 20% of each group (4 of 20 in monotherapy Vs 3 of 15 in polytherapy) had EDS. It might be assume that AED didn't have much contribution to EDS (p = 1,000). Interestingly, none of patients having seizure frequency ≥4 times/month reported EDS.
Conclusion: In this study, 20% subjects had excessive daytime sleepiness, relatively equal with similar study. Both of monotherapy and polytherapy groups had similar proportion of patients that complaint EDS. Another study should be performed with larger sample size to explore factors that contribute to EDS in epilepsy patients. Routine evaluation of excessive daytime sleepiness and sleep disorders should be part of therapeutic strategies of epilepsy patients.

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Telemedicine for epilepsy: effective networking in western China

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Purpose: Shortage of trained neurologists and specialized neurological resources poses prominent health care problems in western China. Telemedicine may be a good way to solve this

problem. This report summarizes the present situation of telemedicine for epilepsy in western China.

Method: The telemedicine network of the Telemedicine Center at West China Hospital (TCWCH) was developed with a "hub and spoke" organizational model that now extends to 534 spoke hospitals in western China. Continuous recording of real-time teleneurology data from May 2002 to May 2013 in TCWCH was sampled from an in-use electronic database and analyzed.

Results: During the 12 years, a total of 1082 neurology consultations was performed, including 45 epilepsy cases. The most epilepsy concultaiton (75%) requested treatment and not diagnostic advice. The most common classification of epilepsy were generalized seizure (66%). The TCWCH Teleneurology consults resulted in a change or adjustment of medication in 90% of consultations, and in the recommendation of additional investigations in 79% of consultations. A questionnaire showed high levels of satisfaction with the technical aspects of the teleneurology consultations and high levels of confidence in teleneurology as a means of delivering specialist neurological expertise.

Conclusion: Telemedicine in China has developed rapidly in recent years and is a feasible, accepted and effective technique for patients in western China. Telemedicine for epilepsy is highly suited to optimize medical resources and improve medical care throughout the wide territory of China.

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Association between epilepsy and insomnia symptom

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Purpose: The purpose of this study was to confirm hypothesis stated that there were association between epilepsy and insomnia symptom, association between anti epileptic drugs status (mono- therapy and poly-therapy) and insomnia, and association between anti epileptic drugs and insomnia degree.

Method: This cross sectional study observed 56 epilepsy patients, completed the following questioner Insomnia Severity Index at outpatient clinic for epilepsy in Adam Malik General Hospital. Patients with depression, anxiety and chronic diseases were excluded from this study. All of data were analyzed by chi-square test.

Results: Subjects consists of 27 (48,2%) female and 29 (51,8%) male, with mean age 30,95 years. More than half of the patients (51,8%) experienced insomnia: 16% with mild insomnia and 37,5% with moderate insomnia. There were 26,8% of patients with poly-therapy anti epileptic drugs and insomnia, and 25% of patients with mono-therapy anti epileptic drugs and insomnia. There was no significant association between antiepileptic drugs and insomnia (p= 0,09). Patients who received poly-therapy anti epileptic drugs with mild insomnia was 5,2% and moderate insomnia was 23%, but patients who received mono-therapy anti epileptic drugs with mild insomnia was 10% and moderate insomnia was 14%. There was significant association between antiepileptic drugs status and insomnia degree (p=0,04)

Conclusion: There was a significant association between anti epileptic drugs status and insomnia degree. Further prospective study with larger subjects is needed to confirm this study.

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Association between type of seizures, anti epileptic drugs and sleep quality in epileptic patients

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Purpose: This study aimed to investigate association between type of seizures, number of anti

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epileptic drugs and sleep quality in epileptic patients.
Method: This was a cross-sectional study, with 56 subjects. All patients underwent physical and neurological examinations, EEG and complete Pittsburgh Sleep Quality Index questionnares. Patients with symptomatic epilepsy, depression and anxiety symptom were excluded from this study. All of data were analyzed by chi-square test
Results: Subjects consisted of 31(55.4%) males and 25(44.6%) females, with mean of age + 32.34 years. Patients with monotherapy, polytherapy and good-quality sleep were 11(19.6%) patients, patients with monotherapy and poor-quality sleep were 13(23.3%) patients, patients with polytherapy and poor-quality sleep were 21(37.5%) patients. There was no significant association between number of antiepileptic drugs and sleep quality (p=0.385). Patients with partial seizures and good-quality sleep were 10(17.9%) patients, patients with partial seizures and poor-quality sleep were 19 (33.9%) patients, patients with generalized seizures and good-quality sleep were 12 (21.4%) patients, patients with generalized seizures and poor-quality sleep were 15 (26.8%) patients. There was no significant association between type of seizures and sleep quality (p=0.446).
Conclusion: There were no significant asociation between type of seizures, number of antiepileptic drugs and sleep quality in epileptic patients.

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The correlation between age, age at onset and duration of epilepsy with health related quality of life
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Purpose: The aim of this study was to examine the corellation between age, age at onset and duration of epilepsy with Health Related Quality of Life by using WHOQOL-BREFF.
Method: This was a cross sectional study of 70 patients epilepsy in Adam Malik General Hospital, aged ≥ 18 years and without comorbid condition were interviewed using WHOQOL-BREFF to measure their quality of life. WHOQOL-BREFF is a 26 item self-administered questionnare focusing on four domain: physical health, psychological, social relationships and environment. The mean score of each domain and the total score were calculated.
Results: Subjects consist of 35 (50%) female and 35 (50%) male, with mean of age ± 36.88 years. Age was a significant positive correlation of the overall WHOQOL-BREFF score (r= 0.421, p < 0,000). Age at onset has a significant positive correlation of the overall WHOQOL-BREFF score (r= 0.348, p < 0.003). But duration of epilepsy was significant negative correlation of the WHOQOL-BREFF score (r= - 0.299, p < 0.012). The mean (SD) of domain physical health was 59.19 (11.74), SEM= 1.33, domain psychological was 61.37 (12.72), SEM= 1.52, domain social relationships was 64.70 (11.43), SEM= 1.36, and domain environment was 62.24 (12.80), SEM= 1.53. The mean (SD) total score of the quality of life scale using WHOQOL-BREFF was 62.39 (11.18), and SEM was 1.33.
Conclusion: Age and age at onset were a significant positive correlation of the Health Related Quality Of Life (HRQOL). Whereas duration of epilepsy is a significant negative correlation of HRQOL. However, demographic and clinical factors, such as seizure frequency in the preceding 12 months, may provide a better explanation of HRQOL in pilepsy.

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Comparison of quality of life between people with epilepsy and epilepsy caregiver in Medan
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Purpose: The purpose of this study was to compare the quality of life between people live with epilepsy and epilepsy caregivers in Medan.
Method: This was a cross-sectional study that consist of 2 groups, people with epilepsy (n= 60) and epilepsy caregivers (n=60). Total sample was 120 and samples were drawn with consecutive sampling. All participants were asked to complete questionnaire about demographic data and quality of life data. The quality of life questionnaire was using the World Health Organization- BREF (WHOQOL-BREF). Demographic data will be analyzed using descriptive statistics. To compare the quality of life between these 2 groups will use MannWhitney test. A p value < 0,05 was considered statistically significant.
Results: The mean quality of life of people with epilepsy was 59,62 (SD = ±10,58; SEM= 1,37; 95% CI 56,88-62,35), it was not very different compare with mean quality of life of epilepsy caregiver 60,33 (SD= ±8,98; SEM=1,16; 95% CI 58-62,65). There was not significantly difference between the means of two samples (p= 0,817)
Conclusion: Mean quality of life of people with epilepsy was lower than epilepsy caregiver. But this difference were not significant statistically.

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The relationship between epilepsy with cognitive function, depressive and anxiety symptoms
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Purpose: The aim of this study was to evaluate the relationships between epilepsy factors with cognitive function, depressive and anxiety symptoms.
Method: A cross-sectional study using the following questionnaires: Mini Mental State Examination, Hamilton Depression Rating Scale, and Hamilton Anxiety Rating Scale. Study was carried out between January 2014 and March 2014. Sixty seven patients with epilepsy (21 symptomatic; 46 idiopathic) were interviewed at the outpatient clinic for epilepsy in Haji Adam Malik General Hospital Medan. Descriptive statistics were used to compute means and frequencies. Significance of associations was tested using the Chi square test statistic (x2) and a ordinal logistic regression analysis. A p < 0.05 was considered statistically significant.
Results: From a total 67 patients were identified, six (9%) patients had cognitive function impairment, 41 (61,2%) patients had depressive symptoms and 25 (37,3%) patients had anxiety symptoms. AED (antiepileptyc drug) status (monotherapy; polytherapy) and seizure duration were each strongly associated with level of cognitive function (each, p-value 0,004 and 0,013). AED status was also strongly associated with depressive symptoms (p-value 0,000). In a multivariable logistic regression model, all variables independently contributed to cognitive function impairment and depressive symptoms.
Conclusion: This study provides support for the notion that epilepsy can impair performance in cognition, depressive and anxiety symptoms. Polytherapy and long seizure duration are independently associated with this outcome. This study did not provide clues on how to exclude the effect of psychosocial variables as additional important confounding variables.

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Concerns and needs of parents of children with epilepsy: Singapore local needs assessment
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Purpose: This study aims to explore and identify the concerns and needs of parents of children with epilepsy in Singapore. Most research to date on children with epilepsy and their parents has been conducted in western populations. These highlight parental concerns involving seizure and medication management, and the impact of epilepsy on their child's life (i.e. that the child will always be dependent on others) (VanStraten & Ng, 2012). We evaluated the concerns and needs of children and parents of children with epilepsy in Singapore to better understand and support them.
Method: Twenty-nine parent-participants of children with epilepsy were recruited from the Paediatric Neurology Clinics at our institution between October and November 2013. A structured interview was conducted in their preferred language using a standardized questionnaire. Parental concerns were categorized into Cognition and Learning, Social Coping, Emotional Coping, Sleep and Appetite, Communication and Speech, Social Perception, Activity Participation, Family Relationships and Future concerns (e.g. unemployment).
Results: Parents reported concerns over (in decreasing percentage) their child's Cognition and Learning (28%), Social Coping (26%), Emotional Coping (22%), Sleep and Appetite (10%), Communication and Speech (4%) and Social Perception (3%).
Conclusion: Singaporean parents of children with epilepsy are most concerned over academic performance, followed by social and emotional coping. These findings differ from Western populations. Support and intervention in the areas of high concern would be the most value-added.

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Knowledge and attitude towards epilepsy among population in Ulaanbaatar

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Purpose: To study knowledge and attitude towards epilepsy among the population and to determine some influencing factors.
Method: Questionnaire was carried out within randomly selected 700 people who ages between from 18-64 from 6 districts in Ulaanbaatar city and executed by cross-sectional method and collect information use 22 questionnaire which word processing specially the knowledge and attitude towards epilepsy compared with the people's age, sex and education level.
Results: Participants' relation male and female in the ratio of 1:2.2, average age was 36.0+9.34 (SD) and 29.3% had university educational degree people. Heard to get information is different from people's age, sex and educational level ($p < 0.05$). 27.9% participants get information and knowledge about epilepsy from relationship and their friends and 23.3% from doctor and clinical workers and few people get information from media. Judging from participant's answers, epilepsy expresses from to have convulsions 25.1% participants, from faint 22.0%, changing character 13.7% and 36.9% do not know. The knowledge towards epilepsy connected with people's age ($p=0.022$) and educational level and not different from sex ($p=0.076$). 49.4% of peoples who are get information to hear about epilepsy had elementary knowledge towards epilepsy and they are 75.3% of participants. 42.1% participants had elementary knowledge about epilepsy, 29.7% had a positive attitude for epilepsy patients. Also 36.6% of people had knowledge about epilepsy and 24.7% of people had not enough knowledge about epilepsy they had a positive attitude towards epilepsy. From this, it showing the knowledge about epilepsy connected with attitude.
Conclusion: Participants 64.1% had awareness about causes of epilepsy, 42.1% had elementary knowledge and 29.7% participant had a positive attitude towards epilepsy. Personal age,educational level, information accessed influences to the knowledge about epilepsy and attitude is connected with educational level.

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Parental concerns towards childhood epilepsy in a rural community in Sri Lanka

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Purpose: Aim of this study is to understand the perceptions, attitudes and practices among parents of children with epilepsy (CWE) towards childhood epilepsy and socio-cultural beliefs surrounding epilepsy in a rural community in Sri Lanka.

Method: We conducted a qualitative study comprising 9 in-depth interviews with parents of CWE and 2 focus group discussions with key informants (teachers, public health midwives, child probation officers) in Ampara district, which has a multi ethnic community in Sri Lanka. Interviews were held in local languages, tape-recorded, transcribed and translated to English prior content analysis.

Results: Lack of knowledge about epilepsy, social discrimination and superstitious believes were identified as key issues. Poor schooling is attributed to learning difficulties, uncooperativeness of teachers and co-morbid conditions. Significance of treatment is valued driven by fear of recurrence. Telling others about child's illness is a stress on parents. Keeping it a secret is not a surprise whereas single mother families tend to prefer telling the neighbors mainly for their support during an emergency. Food practices like avoidance of vegetables that are believed to be 'cold' to body like ladies fingers, bottle gourd, etc. and avoiding citrus fruits in CWE are customary in this community. Uncertainty of seizure recurrence, job opportunities and marriage were major concerns expressed towards the future.

Conclusion: Epilepsy unawareness, discrimination and irrational believes surrounding it are the key factors influencing the attitude and practices in this community. Social discrimination of CWE prevails and intimidates the future of CWE. Sensitization of the community and improved support to CWE at schools could enhance the quality of life and future of children with epilepsy in this community.

This study was funded by HETC QIG W3 grant of University of Colombo.

Ethical clearance was obtained at Faculty of Medicine, University of Colombo.

Status epilepticus

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Factors affecting on the duration of recovery of consciousness in NCSE

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Purpose: Nonconvulsive status epilepticus (NCSE) has symptoms of behavioral abnormality or mental change and prolonged electrographic seizure activity more than 30 minutes. Electroencephalography (EEG) or video-EEG monitoring are necessary for proper diagnosis of NCSE. Longer duration of NCSE, presence of systemic complications and/or brain lesions, and specific EEG findings are poor prognostic factor of NCSE. We performed this study to find factors affecting on duration of recovery of consciousness.

Method: Forty seven NCSE patients were recruited from Jan., 2006 to May, 2011. Patients were treated with antiepileptic drug (AED), such as lorazepam, phenytoin, valproate, and others. All of the patients underwent regular EEG or video-EEG monitoring. We reviewed medical records and analyzed age, sex, previous history of epilepsy, first EEG findings, total duration of NCSE,

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treatment response, underlying neurological or systemic disorders, and drug compliance of epilepsy patients. We divided the patients into two groups according to the duration of recovery of consciousness based on the 24 hours.
Results: Between ´≤ 24 hours group´ and ´> 24 hours group´, we compared the various factors. The NCSE patients with history of epilepsy had significantly shorter duration of recovery of consciousness than that of the patients without history of epilepsy. Patients with previous history of good drug compliance showed the earlier recovery of consciousness. Acute symptomatic causes, non-responsiveness to the first line AEDs, and continuous ictal discharges or PLEDs on EEG affect the longer duration of consciousness. Total duration of NCSE is a meaningful factor to predict the duration of consciousness recovery in NCSE.
Conclusion: In NCSE, previous history of epilepsy and total duration of NCSE might be a useful indicator to predict the point of recovery of consciousness and prognosis. In the previous epilepsy patients, good compliance was a favorable factor for earlier recovery of NCSE.

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In vivo study of synergistic actions of Verapamil and Gabapentin on acute seizure models of mice
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Purpose: To investigate and evaluate in vivo synergistic anticonvulsant effects of novel regimen of Gabapentin (GBP) and Verapamil (VP) on acute models of seizures in mice.
Methods: Chemically-induced seizures model in mice was employed to evaluate in vivo acute anticonvulsive activity of the Gabapentin (GBP) and Verapamil (VP) and their effects were compared with reference drugs i.e. Diazepam (DZ), Phenytoin (PHT) and Valproate (VPT). Synergistic anticonvulsive actions of (GBP) and Verapamil (VP) were evaluated by administrating different doses of the GBP and VP. After administration of the Pentylenetetrazole (PTZ) the mice were observed for latency to onset of threshold seizures (LOTS), rearing and falling (R&F) and hind limb tonic extension (HLTE).
Results: Combination regimens of GBP and VP exhibited synergistic anti-acute seizure effects. It was noted that combination therapy demonstrated synergistic anti-seizure effects at all tested doses as the percentage of inhibitory effects of combination therapy was more than sum of the inhibition percentage of individual drugs.
The anti-seizure effects of combination therapy were compared to reference drugs and it was observed that it completely inhibited the seizures which was comparable to the DZ and VPT. Combination therapy in higher doses was equivalent in efficacy to DZ and VPT but it was noted that it was superior to PHT in both LOTS and R&F.
Conclusion: This study has provided basic work guidelines for the future clinical use of combination therapy of GBP and VP in conditions like status epilepticus and non epilepticus acute seizures. It can reasonably be hoped that in near future the parenteral formulations of GBP would provide better treatment option by employing instant combination therapy of GBP and VP for the management of various forms of acute seizures.

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Clinical profile of patients with epilepsia partialis continua from tertiary care hospital
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Purpose: To analyze the demographic, clinical, radiological findings, underlying etiology and

outcome of patients with Epilepsia partialis continua (EPC) seen at tertiary care hospital in Mumbai.
Method: We retrospectively and prospectively analysed 32 patients with EPC from 2010 to 2013. The images and scalp EEG recordings were reviewed after noting detailed history, demographic and clinical profile of all patients. Underlying etiology, modes of treatment and outcome data of these patients were analysed. Duration of follow up was 6 to 30 months.
Results: Out of 32 patients, 17 were males and 15 were females. Mean age at onset of EPC was 28.12 years (median:22.5 years; range 6-60 years). The mean duration of EPC was 454.6 days (median:8.5 days; range: 12 hrs-27 years). 15(46.9%) patients had seizures prior to the EPC. Out of total 23 ictal EEG, 19(82.6%) were abnormal and out of 9 interictal EEG only 3(33.33%) were abnormal. 28 MRI were abnormal while 4 were normal. Common causes were infective 9(28.13%), Rasmussen's encephalitis 8(25%), vascular 5(15.63%), cortical development malformation 4(12.5%). 9(28.13%) patients were on monotherapy while 23(71.87%) patients were on polytherapy. Out of 32 patients 22(68.75%) were seizure free, 8(25%) failed to respond while 2(6.25%) expired due to their illness. 4(50%) patients with Rasmussen's encephalitis underwent hemispherotomy and are seizure free. One patient with FCD and one with hemimegalencephaly also underwent surgery and are seizure free.
Conclusion: EPC is rare type of focal SE with varied etiologies. Normal Ictal EEG does not rule out EPC. With advent of better imaging standard, FCD is not an uncommon cause of EPC and can be treated surgically. Complete and sustained seizure control can be achieved in Rasmussen's encephalitis by surgery only. Even though EPC is considered pharmacoresistant, prognosis depends upon age at onset, type of EPC and the underlying cause.

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Comparative study of lorazepam, phenytoin, valproate and levetiracetam in status epilepticus

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Purpose: We report the efficacy and safety of lorazepam (LOR), phenytoin (PHT), valproate (VPA) and levetiracetam (LEV) as first and second choice AED in SE and their combinations in preventing refractory SE.
Method: The results of our 2 earlier trials on SE are compared; one evaluated VPA vs PHT (group I) and the other LOR vs LEV (group II). In group I, additional patients were recruited in addition to published data. The primary outcome measures were cessation of SE after first and second AEDs and secondary outcome measures were mortality and side effects. The efficacy of these four drugs as first and second choice was compared. The frequency of refractory seizure in group I and II and their contributing factors were analyzed.
Results: 117 patients were in group I and 79 in group II. The baseline characteristics of the patients receiving LOR, LEV, VPA and PHT were similar. As a first choice LOR controlled SE in 75.1%, LEV in 76.3%, VPA in 55.4% and PHT in 44.2%. LEV and LOR were significantly superior to PHT and VPA. As a second choice, LEV was effective in 88.9%, LOR in 70%, VPA in 74.1% and PHT in 25%. As a second choice LOR, LEV and VPA were significantly better than PHT. Refractory SE was more frequent in group I than group II (29.9%vs10.5%) however complications and mortality were higher in group II.
Conclusion: LOR and LEV combination is superior in reducing refractory SE but at the cost of higher complications and death.

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Clinical characteristic of status epilepticus: a 10 years case review in a local hospital in Hong Kong

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Purpose: To review the clinical characteristics of status epilepticus managed in the intensive care unit in a local hospital in Hong Kong.
Method: A retrospective review of 23 patients with status epilepticus treated in the intensive care unit in Tseung Kwan O Hospital from Jan 2003 to Jan 2013 was conducted.
The patients´ demographic data, clinical manifestations, investigations and outcomes were studied.
Results: Of the 23 patients, 78 % of them were male. The mean age was 47. 78 % of patients were young adults, in the age group of 20-59 years old. Encephalitis were the commonest etiology, contributing to 20 % of the cases. The second commonest etiology were post CVA epilesy, drug overdose and hypoxic brain damage. 74 % of patients presented with generalized tonic clonic convulsion. 83 % of patients had denovo status. The commonest features in electroencephalogram were subclinical seizure/ spike with evolution. 83 % of cases of encephalitis showed bilateral hippocampi involvement. 61 % of patients received polytherapy and in which 10 % of patients used up to 4 different anti-convulsants. Phenytoin was most frequently used. 40 % of patiens received general anaesthetic treatment. Immunotherapy was used in all cases of limbic encephalitis. Pneumonia was the commonest complication.
The mean length of ICU stay was 6.8 days and the mean length of hospital stay was 40.7 days. 26 % of patients had new functional disability upon discharge. The 30 days mortality was 13 %.
Conclusion: The outcome of our centre is comparable to previous study with the mortality rate of 13 %, and limbic encephalitis were the commonest etiology.
Our analysis demonstrated that status epilepticus due to underlying limbic encephalitis was associated with long hospital stay. However, aggressive treatment for status epilepticus and immunotherapy can result in favourable functional outcome especially in young adults.

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A diagnosis of cefepime-induced non-convulsive status epilepticus (NCSE) on electroencephalography in a patient with normal renal functions

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Purpose: Non-convulsive status epilepticus (NCSE) is a neurological emergency that is characterized by altered mental status without any notable convulsive motor signs where continuous epileptiform discharges are detected on electroencephalography (EEG). It may lead to fatal conditions because it would be refractory to anti-epileptic drugs if later diagnosed or left untreated. In a clinical setting, however, its diagnosis is often missed because there is a possibility that clinicians might neglect its presence in patients presenting with such symptoms as mental deterioration.
Method & Results: A 69-year-old woman visited us with a chief complaint of a sudden onset of altered mental status. Prior to visiting us, the patient had undergone surgery for a 4-month-history of osteomyelitis of the right mandible at department of dentistry at our medical institution. Meanwhile, the patient developed infections and then received antibiotic treatments with prepenem, vancomycin and cefepime. After the cefepime treatment, the patient presented with a sudden loss of consciousness. Then, the patient underwent magnetic resonance imaging (MRI), cerebrospinal fluid (CSF) analysis and electroencephalography (EEG). Based on these EEG

findings and clinical course, the patient was diagnosed with NCSE. The patient was suspected of having cefepime-induced neurologic toxicity. With the withdrawl of cefepime and the initiation of the intravenous phenytoin, the patient achieved a dramatic recovery of symptoms.
Conclusion: Our case indicates that clinicians should be aware of the possibility of cefepime-induced NCSE when prescribing cefepime even in patients with normal renal function who had no past history of epilepsy. In these cases, they should perform EEG to make a prompt, accurate diagnosis of it.

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Characteristics of patients with refractory status epilepticus using multi-center registries in South Korea
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Purpose: In order to find out clinical characteristics of patients with status epilepticus (SE), especially refractory SE (RSE), we have constructed a web-based registry. We also tried to find which factors determine the outcome of SE.
Method: In eight different university hospitals, we enrolled SE patients who visited emergency department or was consulted to neurology department from November 2012. Those with hypoxic brain damage (e.g. after cardiac arrest) were excluded. Information about age, gender, weight, height, body mass index (BMI), seizure history, other medical illness, etiologies of SE, findings of electroencephalography and neuroimaging, treatments, and outcome measures such as modified Rankin score (mRS) were entered into a web-based registry. These clinical characteristics were compared between SE and RSE. Pearson's or Spearman's correlation analyses were used to identify relationships between variables.
Results: 68 SE patients aged 54.9±19.9 years (male 41.9%) were enrolled. The mean height, weight, and BMI were 162.1±8.5 cm, 57.3±13.1 kg, 21.8±4.5 kg/m2. 31.6% and 4.4% of the patients had history of epilepsy and status epilepticus, respectively. Patients with RSE had less weight than those without (58.2±11.8 vs. 50.4±16.0, p=0.046). The percentage of RSE was higher in nonconvulsive SE than in convulsive SE (34.6% vs. 16.2%, p=0.047). Although mRS at admission did not differ between SE and RSE, the mRS at discharge was higher in RSE than in SE [2 (0, 4) vs. 5 (4, 5), p=0.025]. 25% of the patients with RSE needed ventilator care, the duration of ventilator care significantly correlated with BMI (r=-0.648 and p=0.031). Also, weight of patients significantly correlated with mRS at discharge (ρ=-0.329 and p=0.024).
Conclusion: Many patients with nonconvulsive SE have RSE, which emphasizes evaluation of patients with altered mentality to diagnose and treat nonconvulsive SE properly. RSE patients with less weight seems to have worse outcome, which needs further investigation.

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Commencement of ketogenic diet in the intensive care unit

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Purpose: To review the usefulness and difficulties in commencing ketogenic diet in the intensive care unit setting

Method: Retrospective chart review for cases who have started ketogenic diet in the intensive unit from Jan 2011 to Feb 2014. Patients' demographic data and underlying diagnoses, concurrent treatment and clinical conditions were reviewed. The indications, types, duration and efficacy of the diet were reviewed:

Results: Three patients had started ketogenic diet in the intensive care units during the study period. Their age ranged from 6 to 16 years old (2 boys, 1 girl). All of them had de novo onset of super refractory status epilepticus. Ketogenic diet was started around Day 12-18 of intensive care unit admission. All diets were initiated by pediatric neurologists. All patients used ketocal-based formula, two started from 3:1 ratio (fat to carbohydrates and protein grams) and stepped up to 4:1 the next day if tolerated; the other started with 4:1 ratio and stepped up the volume gradually. Stable ketosis was achieved in two of the patients only. The diet was kept for 9-10 days in all three cases. Problems encountered include: falling protein content during the diet, "worsening seizure control", sepsis, failure to achieve ketosis, dehydration, hypotension and multiple interventions, etc. No obvious efficacy was observed in these patients.

Conclusion: There were some practical difficulties in commencing and keeping ketogenic diet in the intensive care unit setting. The role and efficacy of this "new" treatment modality in super refractory status epilepticus remains to be defined.

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Refractory status epilepticus in children - a case series

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Purpose: To describe the clinical features, treatment and outcomes of children with refractory status epilepticus admittted to our tertiary children´s hospital.

Method: This was a retrospective case series. Refractory status epilepticus was defined as prolonged or recurrent seizures (clinical and/or electrographical) requiring more than 3 anti-epileptic medications lasting more than 24 hours.

Results: Between 2007 to 2013, 10 children were identified. Age ranged from 20 months to 16 years, and 6 were female. 9 had preceding febrile illness. All received immunotherapy (steroids, IVIG and/or plasmapheresis) although none subsequently had proven infective or autoimmune etiology. All 10 were treated with more than 5 anticonvulsant medications including barbiturate burst suppression coma. Ketogenic diet was used in 4 and 1 had vagus nerve stimulator implanted. All had prolonged intensive care unit stay, with 6 requring tracheostomy. 2 patients died, 4 patients have profound neurological disability and are wheelchair-bound and the remaining are ambulant but have cognitive or significant psychiatric sequelae. Febrile illness related epilepsy syndrome (FIRES) was diagnosed in 4, and new onset refractory status epilepticus (NORSE) in the rest.

Conclusion: Refractory status epilepticus in children is uncommon and difficult to treat. In our series of 10 patients, no single intervention was found to be superior in seizure control. Outcomes were poor with significant mortality and morbidity. Given that febrile illness was a common feature in all, it is possible that FIRES and NORSE may reflect the same clinical entity.

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A Korean young child of anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis presenting with epilepsia partialis continua

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Purpose: We report a case with anti-NMDAR encephalitis who presented with epilepsia partialis continua and subacute evolution of dyskinesias and autonomic instability in the absence of tumor at a young age, confirmed by anti-NMDAR antibody testing.

Method and results: A three year-old-girl was admitted due to right sided complex partial seizures. She had mildly delayed development in motor and her seizures began without antecedent febrile illnesses. During initial presentation, although brain magnetic resonance imaging (MRI) and electroencephalogram (EEG) showed normal findings, her seizures evolved to epilepsia partialis continua, which was accompanied by left frontal spike discharges and right hemispheric slowing on interictal EEG and were slowly improved by multiple antiepileptic drugs. During the third week admission, the patient suffered from sleep disturbance and developed noticeable oro-lingual-facial dyskinesias, the choreoathetoid movements, and hypertension. Given these characteristic symptoms, Anti-NMDAR encephalitis was considered as a important differential diagnosis and confirmed by the detection of antibody to the NMDA receptor in serum and CSF. Radiologic screening for a malignant tumor and serological or CSF studies that ruled out other disorders revealed normal findings. Even though she slowly improved with immunoglobulin and methylprednisolone, she was also treated with rituximab over 4 weeks for more favorable outcome. At present she is no longer treated with multiple antiepileptic drugs, and antihypertensive drugs and shows gradual improvement of motor and cognitive function

Conclusion: Anti-NMDAR encephalitis can initially present as epilepsia partialis continua with alteration of cognition. So it is important to consider anti-NMDAR encephalitis in children with uncontrolled seizures followed by the development of dyskinesias, even if they are young age without evidence of a malignant tumor and aggressive immunotherapies with agents including rituximab should be considered in order to improve outcomes.

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Efficacy of corticosteroids in the management of non-convulsive status epilepticus in Lennox-Gastaut syndrome

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Purpose: Lennox-Gastaut Syndrome (LGS) is a rare, age-related syndrome, characterized by multiple seizure types, a specific electro-encephalographic pattern, and mental regression. More than 50% of patients with LGS develop Non-Convulsive Status during the course of disease. Objectives were to assess the clinical responder rate, remission of electrical status, quality of life and behavior improvement with the trial of corticosteroids.

Method: Patients were selected over period of 18-months under stringent criteria. Add on high dose steroids were give for 14 days (30mg/kg/day intravenous Methyl Prednisolone for 5-days followed by 2mg/kg/day of oral Prednisolone for 9-days) with a gradual taper over a period of 6-weeks. Twice a week pulses of Prednisolone (2mg/kg/day) were commenced afterwards to complete 24-weeks study duration. Patients were closely monitored at predefined intervals during the trial.

Results: Fourteen children aged 2.5-16.3 (mean-6.8) years; fulfilled the inclusion criteria.

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Variation in conscious level (9/14), fluctuating behaviour (5/14), motor automatisms/subtle motor phenomena (4/14), poor balance/falls (4/14) and drooling of saliva (3/14) were the commonest clinical manifestations. EEGs of the entire sample had continuous generalized spikes/spike wave discharges (mean frequency-2.8Hz). Three dropped out before day-14. (Severe hospital acquired infection, uncontrollable hypertension and parental concerns were the reasons). Eleven who complied became symptom free by day-14. Ten had electrical remission by day-14. One did not respond. One relapsed at 24-weeks. Changes were observed in the height velocity, blood pressure and the serum biochemistry were unremarkable, however BMI was significantly increased at 12-weeks ($p< 0.05$) in all.Quality of life (PedsQLTM) and Childhood Behaviour scores improved ($P< 0.05$) in the sample at 24-weeks.
Conclusion: Majority achieved a sustained electrical remission, significantly improved quality of life and behaviour scores with minimal adverse effect profile by the corticosteroid regimen trialed.

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Convulsive status epilepticus in Thai children: mortality rate and its predictors
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Purpose: To determine the mortality rate in children with convulsive status epilepticus (CSE) and predictors on mortality rate.
Method: This study was conducted at Maharat Nakhon Ratchasima Hospital, the largest referral hospital in the Northeast of Thailand. Infants and children diagnosed with CSE from 1 January 2011 to 30 June 2012 were recruited. Demographic data, etiology, treatment, and clinical course were collected. Each patient was evaluated for the outcome after hospital discharge at 1, 3 and 6 months. Mortality rates were classified into the short-term mortality (died within 30 days) and the long-term mortality (died after 30 days). Frequency and percentage were used for descriptive analysis. Fisher's exact test and logistic regression were applied for univariate and multivariate analysis respectively.
Results: Sixty patients (31 boys, 29 girls) with mean age of 3.8 years were enrolled. Eighteen children (30.0%) were epileptic patients. Etiologies of CSE were acute symptomatic (51.7%), febrile (30.0%), cryptogenic (6.7%), remote symptomatic (6.7%) and progressive symptomatic (5.0%). Overall mortality was 11.7% (short-term mortality 5%, long-term mortality 6.7%). High overall mortality rate was related to the deviation of initial treatment from the National Clinical Practice Guideline for status epilepticus ($P < 0.05$, adjusted OR 8.67, 95% CI 0.95-79.4) and the prolonged seizure duration ($P < 0.05$, adjusted OR 19.67, 95% CI 1.7-233.3). Subsequent epilepsy was found in 16 patients (38%). Six patients (14.0%) and twelve patients (27.9%) had severe disability and mild disability respectively.
Conclusion: Overall mortality rate of 11.7% in children with CSE was observed in this study. Prompt and appropriate initial treatment would be a key factor for mortality rate reduction.

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Super-refractory status epilepticus - predictors, treatment outcomes: a study from a tertiary care center in south India
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Purpose: Super-refractory status epilepticus (SRSE) is an uncommon disorder associated with high morbidity and mortality. This study aims at studying the predictors and treatment, which included ketamine, outcomes in SRSE
Method: This is a retrospective review of case-records of all patients with convulsive SE (CSE)

admitted to a NICU in a tertiary care center between March 2011 and March. SRSE was defined as SE that continues or recurs 24 h or more after the onset of anesthetic therapy, including those cases where SE recurs on the reduction or withdrawal of anesthesia. The data collected included: demographic and clinical details, possible etiology and imaging findings, duration of CSE and medications received before admission, time of institution of anesthetic and ketamine therapy, time taken for burst suppression (BS) induction, and outcome. All patients had contiguous EEG monitoring (cEEG). All patients on admission were initially treated with IV loading dose of fosphenytoin/valproate/levetiracetam followed by cIV midozolam with cEEG monitoring. Patients who failed to this regime were started on ketamine. Outcome at follow-up was assessed using Glasgow Outcome Scale (GOS).

Results: Of the 39 patients with CSE referred, 14 (35.9%) went on to SRSE. In two patients BS was not achieved (both died), in 12 (all with SRSE) BS could be achieved with addition of cIV ketamine. Differences in the variables between CSE and SRSE were: mean age·48.8+17.6 vs. 56.57+12.76; M:F·16.9 vs. 10:4; acute symptomatic etiology·5(20%) vs. 11(78.6%); time taken for BS·2.5+0.38 vs. 21.46+13.46; poor outcome (GOS1·3): 12% vs. 36%. The independent predictors for CSE to go on to SRSE were, age and acute symptomatic etiology.

Conclusion: In this study age and acute symptomatic etiology were the predictors for CSE to go on to SRSE, Addition of cIV ketamine to cIV midazolam resulted in BS in patients with SRSE,

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Status epilepticus in Thailand

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Purpose: Status epilepticus (SE) is a major neurological emergency that is associated with a significant mortality. The national database of SE in Thailand and other developing countries is limited in terms of incidence and treatment outcomes.

Method: We retrospectively explored national data in Thailand for reimbursement of all adult patients (over 18 years old) admitted SE patient in the fiscal year 2004-2012. SE patients were diagnosed and searched based on ICD 10 (G41) from the national database. There are three health insurance systems; Universal Health Coverage Insurance, Social Security, and Government Welfare System

Results: We found 12,367 SE patients. The average age was 48.14 years (18-104 years) and 8,119 patients were males (65.7%). Discharge status of most SE patients was improved (9,231 cases, 74.6%), while 2,033 patients (16.4%) did not improved and 1,045 patients (8.4%) died. Only 58 patients (0.5%) showed complete recovery. The most common comorbid diseases were hypertension (1,790 patients, 14.5%); DM (1,064 patients, 8.6%) and stroke 1,790 patients, 14.5%).Pneumonia was the most common complication in 1,201 patients (9.7%).

Conclusion: Based on our data, at least 12,367 patients would be affected by SE in Thailand, associated with 1,045 deaths annually. Furthermore, this study confirms the higher incidence of SE in male patients.

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Electroclinical characterics of nonconvulsive status in adults: s study from South India

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Purpose: Non convulsive status epilepticus (NCSE) represents an important percentage of status epilepticus in adults, but detailed studies of both NCSE proper and comatose NCSE are few. We retrospectively analyzed continuous EEG and clinical data of 62 adult patients over a period of one year (2013) admitted with altered consciousness to the neurointensive care.
Method: Two groups, NCSE proper and comatose NCSE were identified. All clinical, cEEG, neuroimaging data, antiepileptic treatment and outcome were analyzed.
Results: Twenty eight patients had NCSE proper and 34 patients had comatose NCSE. Mean age was similar in both the groups (42.6 years and 47.3 years). Recent history of seizures was significantly more frequent (57.1% versus 17.6%) in the NCSE proper group ($p< 0.05$). The most common aetiology in the NCSE group was neuroinfection (53.6%), ischemic stroke was seen in 28.6%, haemorrhagic stroke in 14.3% and others in 7.1%. The commonest aetiology in the comatose NCSE group was metabolic encephalopathy (38.2%), ischemic stroke in 26.5%, neuroinfection in 23.5% and others in 11.8%.
The EEG abnormalities in the NCSE proper group included electrographic seizures in all patients (100%). Ictal patterns were classified as discrete seizures in 13 (46.4%) merging seizures in 2 (7.1%) continuous ictal discharges in 5 (17.8%) and periodic epileptiform discharges in 8 (28.6%). EEG abnormalities in comatose NCSE included periodic discharges in 21 (61.8%) (lateralised 14 , generalised 7), burst suppression pattern in 5 (14.7%) and others in 8 (23.5%). PLED plus EEG pattern was found significantly more frequently in NCSE proper group (15 versus 2).
Conclusion: NCSE is not uncommon in critically ill neurology patients. Recent history of convulsions was the strongest predictor for NCSE. PLED plus is significantly more common in NCSE patients.

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Serial MRI change related to status epilepticus

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Background: MRI abnormalities in the postictal period may represent the effect of the seizure activity. Transient focal hyperintensity on diffusion weighted MRI have long been described in epileptic seizures, especially in patients with status epilepticus. It may be a consequence of transient metabolic and hemodynamic changes leading to seizure induced cytotoxic and vasogenic edema.
Case: A 28-year-old man presented repetitive generalized tonic-clonic seizures and decreased mentality. His medical history showed that he had bilateral mesial temporal lobe epilepsy and didn´t take antiepileptic drug for several days.
Neurological examination revealed unconsciousness with a Glasgow Coma score of 7. Laboratory test showed high level of creatine-kinase and ammonia. After intravenous injection of antiepileptic drug, seizures were not controlled. Seizures were controlled with intravenous infusion of midazolam. The duration of repetitive seizure was 3 hours.
After recovery of mentality, neurological examination showed left hemiparesis. On the first day EEG showed right hemispheric PLEDs and MRI showed normal findings.
His left hemiparesis wasn´t improved and repetitive MRI on the third day revealed diffuse high signal in right frontotemporoparietal lobe, right basal ganglia and posterior corpus callosum on diffusion weighted MRI.

After eight months, his left hemiparesis was improved with incomplete recovery and MRI showed diffuse atrophy of right hemisphere with diffuse high signals of T2 weighted image in both periventricular white matter.
Conclusion: The finding of diffusion weighted MRI suggested delayed development of neuronal injury. These changes might be helpful in localizing ictal brain activity, propagation during seizure and assessment of possible neuronal damage. Late MRI finding such as prominent atrophy may be caused by excitatory neurotransmitter release that is a late complication of excessive neuronal firing in experimental model.
This case support that these changes of MRI may be an early sign of excitotoxic neuronal injury and delayed cell death in status epilepticus.

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Clinical and laboratory findings and outcome of patients with EEG status epilepticus in an acute tertiary care hospital in Singapore
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Purpose: To study the clinical profile of patients with Electroencephalographic (EEG) status epilepiticus (SE) in an acute tertiary care Singapore Hospital.
Method: From January 2012 to December 2013, patients with a diagnosis of EEG SE were identified retrospectively from the EEG laboratory. EEG Status was defined as having (a) continuous ictal discharges lasting >5 min or (b) >2 discrete bursts of ictal discharges, each lasting < 5 min, without returning to previous background rhythm in between these bursts. Date of first EEG showing SE was considered onset and first seizure free EEG was considered as termination. The clinical, metabolic and radiologic factors were studied in these group of patients.
Results: Among 1698 hospitalized patients, 55 (3.23%) (27 females, 28 males) had EEG SE. Their mean age was 62.1 years (16 to 91). 20 (36.3%) patients had existing epilepsy. 25 (45.4%) had definite clinical seizure at presentation. Average interval for recovery from SE was 4 days (1 to 14, median 3 days). 36.3% showed raised urea which improved with recovery in 75% of these patients. 56.3% patients had leucocytosis at presentation. 32% had normal neuroimaging, 36% showed unilateral & 20% showed bilateral scars, and 12% had diffuse changes. Duration of SE was longest in patients with diffuse neuroimaging changes (mean 5.2 days) and shortest in patients with bilateral scars (mean 2.3 days). About half of the patients required 3 or more anti-epileptic drugs to control SE. 25.4% of patients either died or had significant neurologic decline at discharge, 45.4% returned to baseline while the rest had mild functional decline.
Conclusion: EEG status were mainly subclinical, more commonly seen in non-epileptic patients, associated with raised urea & leucocytosis, and took longer time to recovery if patients had diffuse neuroimaging changes. Patients with EEG SE were associated with high morbidity and mortality.

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Super Refractory Status Epilepticus of "NORSE " type, consequences of appearance, progress and outcome: our double experience
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Purpose: New Onset Refractory Status Epilepticus is life-threathening condition with high mortality. It is mostly described as leading to death or coma vigile, but it can have optimistic outcome.
Methods: We describe 2 patients with NORSE Patient No 1-woman,1983, Korean origine,

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hospitalized in 2012. Patient No 2, man, 1978 , white race (CZ) hospitalized in 2013.Medical history- non specific virosis in healthy young individuals. Epileptic seizure worsening in status epilepticus The EEGs pattern was unusual. Spikes and slow waves had no organization rules, either left od right side appearance, or generalized, so did ictal pattern..Cerebrospinal fluid -no specific agent. Limbic encephalitis antibodies-negative.MRI scan-hyperintensity of claustrum on both sides in both patients. Due to suspicion to autoimmune origine plasmaferesis was used. Sepsis led to death of the first patient after one month of treatment .The man had at the beginning ictal psychosis and cognitive decline .Severe rhabdomyolysis in laboratory findings aggravated the somatic condition.Complete ICU care with ventilation support was needed. Due to EEG pattern ,despite of negative MRI finding at the beginning ,led us to the previous case, more intensivee administration of AED in combination with plasmaferesis was used .Repeated MRI scan proved the clinical connection between the patients.

Results: The man survived and his outcome is very optimistic.Slight cognitive decline,recurrent memory loss,no on sleep(polysomnography).Since discharge he underwent 5 single epileptic seizures,4 in sleep,1 during daily activities.Actually he seems to be stabilized on combination of levetiracetam,phenytoin and lamotrigine with plan of phenytoin reduction due to side effects.MRI scan proved no claustrum affection in 90 days.

Conclusions: NORSE is severe life threatening diagnose .Bilateral claustrum lesion is casual in SE severity and is reversible.Etiology is not clear,but it seems to be combination of non-specific virus agent and autoimmune mechanism. Survirval of NORSE can lead to acceptable life quality with hope of returning to former profession.

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Acute DWI abnormalities in status epilepticus

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Purpose: Transient focal abnormalities on diffusion-weighted MRI in status epilepticus may represent increased energy metabolism, hyperperfusion and cell swelling as a consequence of ictal activity.

The purpose of this study is including 1) to determine the reversible abnormality on diffusion-weighted MRI and 2) to discuss its mechanisms and clinical significance.

Method: Retrospective review of chart of 39 patients (21 men, 18 women) presenting with status epilepticus. Patients with CNS infection like encephalitis, acute trauma or acute stroke were excluded from this study. All patients underwent brain MRI within 1 week from the seizure onset. The diagnosis of status epilepticus was based on clinical criteria.

The sites and characteristics on brain diffusion-weighted MRI were recorded.

Results: 39 patients presented with status epilepticus and underwent brain MRI within 1 week. Of them, 11 (28.2%) patients exhibited focal abnormality on diffusion-weighted MRI. Location of abnormality was cortical, thalamus, hippocampus and pulvinar. 3 patients showed bilateral signal abnormality.

Repetitive MRI showed that reversibility was in 7 patients and residual atrophy was in 4 patients. One patient with residual atrophy had a neurological deficit such as permanent left hemiparesis.

Conclusion: Our findings revealed that the abnormality on diffusion-weighted MRI and residual brain atrophy in status epilepticus is more frequent than previous study. These abnormalities may reflect the epileptogenic hyperexcitation and propagation of ictal discharge.

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Super refractory status epilepticus in a case of FIRES (fever induced refractory epileptic encephalopathy syndrome)

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Purpose: To report super refractory status epilepticus (SE) in a previously healthy child which SE recurred after multiple modalities of treatment.
Methods: Clinical data including continuous video EEG and amplitude EEG (aEEG) recordings were extracted from the patient's file.
Case report: A 10 years old boy presented with prolonged SE. He was previously healthy and only had high-grade fever 3 days before SE onset. SE was stopped with Phenytoin, Phenobarbital, Midazolam, Levetiracetam and Topiramate then recurred back. Midazolam was titrated up to 28 mg/kg/min. He underwent Phenobarbital coma with level of 200 mg/ml. Methylprednisolone was also given. His extensive work up included Dandy Walker Variant in MRI, negative CSF for panenterovirus, HSV, CMV, VZV, EBV, HHV 6 , negative CSF autoimmune panel (include NMDA, AMPA, GAD, Ampiphysin 5, CRMP 5, GABA-b, VGKC, SRP-54)(1) and negative anti-thyroid peroxidase antibodies. He was diagnosed with FIRES. His aEEG was in burst suppression for 15 days. Phenytoin and Phenobarbital were discontinued due to Drug reaction and eosinophilia and systemic symptoms (DRESS). SE recurred 9 days later. EEG demonstrated frequent rhythmic epileptiform discharges from mutiple foci. EEG turned into bust suppression after Midazolam 35 mcg/kg/min, Ketamine 38 mg/kg/min and Propofol 13 mcg/kg/min, therapeutic Hypothermia and IVIG. Ketogenic diet was contraindicated with Proprofol infusion. After 2 days Propofol was discontinued due to Propofol infusion syndrome. Isoflurane Inhalation was conducted in our ICU. SE recurred after weaned off other intravenous anesthetics. Intravenous anesthetics were put back and SE briefly stopped then recurred again. Blood pressure was supported by maximum dosage of inotropic medications. He underwent CVVH for acute renal failure and severe hyperkalemia. He finally expired after 4 day of super refractory SE.
Conclusion: We described a unique case of super refractory SE in FIRES patient that we used almost all modalities that were reviewed in the literatures.(2, 3) Morbidity and mortality in super refractory SE was high.
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Evaluation of the correlation of preoperative test results with prognosis and pathology results in cases with temporal lobe epilepsy

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Purpose: In the current study, we aimed to evaluate the correlation between the preoperative tests of cases that have been operated on due to drug-resistant TLE and seizure-free rates during postoperative follow-up.
Method: Thirty-five patients that were followed-up with the diagnosis of drug-resistant TLE at Gazi University Faculty of Medicine's, Adult Epilepsy Monitoring Unit and determined as the candidates for surgery, were prospectively evaluated. The epileptic foci of the patients included in the study were determined, preoperative noninvasive procedures were completed, and their tests were compared with each other and with postoperative pathology results. Anterior temporal lobectomy (ATL) was performed in all cases and the patients seizure-free period was monitored for two years
Results: As a result of the present study, we observed that PET and cranial MRI contribute to the identification ofthe epileptic focus at a high rate similar to ictal EEG and semiology, which are gold standard preoperative investigations. When the imaging methods were correlated with the ictal EEG, the lateralization value of PET in the determination of epileptic focus was quite high and the sensitivity was found to be 100%. While the sensitivity of the cranial MRI in the determination of epileptic focus was 97%, the sensitivity of routine EEG and MRS were found to be 82.9% and 79.4%, respectively. The seizure-free rates of the cases after surgery was 82.8% at the sixth month and in the first year ; this ratio was determined to be74.3% in the second year.
Conclusion: As a result, the surgical success in TLE cases depends on precise preoperative examination. Similar to the present study, although it is known that each preoperative investigation has an effect on localization and prognosis, the compatibility of the results with each other and their localization of a single focus are quite important for good surgical prognosis.

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Efficacy of a surgical intervention combining vagus nerve stimulation with corpus callosotomy in patients with Lennox-Gastaut syndrome and multiple seizures
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Purpose: Lennox-Gastaut syndrome (LGS) is drug-resistant epilepsy with multiple seizure types. Vagus nerve stimulation (VNS), which has been widely used for LGS-related seizures as a palliative surgery, has a higher priority than corpus callosotomy (CC). We evaluated the efficacy of a approach combining surgical intervention of CC for drop attacks followed by VNS for residual seizures in patients with LGS.
Methods: Seven patients with LGS underwent anterior (n=1) or total (n=6) CC and subsequent VNS for drop attacks (DA), myoclonus, atypical absence (AA), head drops (HA), and tonic seizures (TA). VNS was performed in 11-56 months after CC. Seizure outcomes of CC, and subsequent VNSs were evaluated retrospectively.
Results: After CC, seizure freedom of DA and myoclonus was obtained in 4 of 6 patients and 1 of 3 patients, independently. After subsequent VNS, further seizure freedom was observed in 2 of 6 AA cases, 2 of 7 TA, and 1 of 2 HD. None of the remaining 2 patients with residual DA after CC responded to VNS.
Conclusion: CC is more likely to be effective to drop attacks. VNS earned add-on efficacy to some residual seizures after CC. Surgical intervention of CC combined with subsequent VNS may be an effective strategy to control LGS-related seizures.

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Impact of intraoperative MRI on outcomes in epilepsy surgeries: preliminary experience of two years

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Background: Epilepsy surgery is evolving exponentially with advances in technologies focusing on optimal visualization of epileptogenic zone for its removal. Present study describes our preliminary experience with intraoperative magnetic resonance imaging (iMRI) in surgical treatment of pharmacoresistant epilepsy (PRE).
Objective: To determine the impact of iMRI in epilepsy surgeries with regards to extent of surgical resection and seizure outcomes along with its feasibility and limitations.
Study design: Prospective.
Methods: Patients undergoing epilepsy surgeries in operating theater equipped with iMRI were evaluated for extent of resection, operative time, pathologies, resultant extra resection and seizure outcome along with complications.
Results: Thirty-nine patients with mean age of 18 years (range 3-65 years) with PRE underwent surgical intervention. Mean duration of seizures was 10.2 years. Surgical interventions included tumor resection (23%), resection of focal cortical dysplasia (28%), medial temporal lobe surgeries (18%) and disconnection surgeries (31%). In 13% (5 out of 39) of these patients, iMRI was decisive and resulted in increased resection of lesions despite extensive use of electrocorticography and navigation in all cases. In lesions undergoing resection surgeries, it made 36.6 % change in surgeon's intraoperative decision for additional resection. Complete resection was observed in (89%) of patients. It is at the cost of 24% increase in operative time without any clinical complications of prolonged anesthesia and surgeries. Major and minor complications were observed in 2.5% and 10% of patients respectively. The mean follow-up was 14 months. Favorable postoperative seizure control (Engel Classes I and II) was achieved in 85% and complete seizure freedom in 77% patients. Favorable seizure outcome in resection surgery groups was 90% at last follow up.
Conclusions: Intraoperative MRI increases the extent of resection mainly in extratemporal lesional epilepsy surgeries translating in good seizure outcomes. iMRI is not feasible for mesial temporal lobe surgeries and disconnection surgeries.

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The anterior thalamic radiofrequency lesions in patients with intractable seizures

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Purpose: The anterior thalamus plays an important role in secondary generalization of seizures. Many studies showed that the anterior thalamic stimulation prevents or reduces seizures in patients with intractable epilepsy. However the bilateral ANT lesions in humans haven't been described in literature before. The aim of the present study was to investigate the influence of anterior thalamic nucleus lesions on secondarily generalized seizures in human.
Methods: Five patients with refractory epilepsy underwent bilateral stereotactic radiofrequency lesions of anterior thalamic nuclei. The RF electrode 1.6 mm in diameter and 3 mm tip was used. Results: There were 4 men and 1 female aged from 22 to 43 years. 4 patients have bilateral epileptic foci in temporal or frontal lobes with unremarkable MRI scan. One patients previously have TBI with bilateral epileptic foci. Mean target coordinates were 2.8 mm anterior, 4.9 mm

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lateral and 12.0 mm above the midcomissural plane. All cases were done under the local anesthesia. In all cases we used the microelectrode recording with simultaneous EEG-monitoring during the operation. The electrode trajectory was intra-ventricular in all patients. After the temporary lesion with 45 degrees, 60 sec and checking the neurological signs, memory and speech, the permanent lesion was done with 70 degrees for 60 sec. The lesions were confirmed by postoperative MRI. The mean lesion diameter was 3.5 mm. Treatment showed a statistically significant decrease in seizure frequency, with a mean reduction of 80 % (follow-up from 2 until 12 months). Two patients are seizure-free at the moment. No adverse effects, including the memory impairment or behavioral changes were observed after.
Conclusions: bilateral RF - lesion of the anterior thalamic nuclei guided be the intra-operative MER is a safe procedure and highly effective in patients with medically resistant seizures.

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Two cases of temporal encephaloceles presenting with intractable epilepsy
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Purpose: We present 2 cases of temporal encephaloceles presenting with intractable epilepsy.
Case 1: This 20-year-old man presented with a 5-year history of intractable epilepsy. He suffered from weekly CPSs with automatisms and monthly SGTCs, suggesting temporal lobe epilepsy. EEG and nuclear imaging suggested left mesial temporal foci. Since there was no evidence of hippocampal sclerosis in MRI, he was implanted with intracranial electrodes for diagnostic purpose. Surprisingly, after the electrode implantation, any epileptic activity including interictal spikes disappeared. Although he discharged our hospital without resective surgery, he is still seizure-free for these 5 years. Retrospectively, a left temporal encephalocele was pointed out.
Case 2: This 39-year-old man suffered from intractable epilepsy for 5 years, and he had monthly CPSs with oral automatisms. Preoperative MRI revealed a left temporal encephalocele with a large bone defect in the middle fossa, and ictal EEG showed his habitual seizures originated from the left temporal lobe. The temporal encephalocele was thought to be the cause of temporal lobe epilepsy. His anterior temporal lobe including the encephalocele was disconnected. The mesial temporal lobe was preserved due to poor epileptiform discharges. Six months have passed with no adverse event since the surgery, and he remains seizure-free.
Discussion: Temporal encephaloceles are so rare conditions that only a few case reports mentioned the relation between temporal encepaloceles and epilepsy. We should recognize them as a possible cause of temporal lobe epilepsy.

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Supracerebellar transtentorial approach to the mediobasal structures of the temporal lobe
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Purpose: The mediobasal temporal region has the most complex anatomy and deep location. Selecting and performing a surgical approach to the mediobasal temporal region still remains a challenge.
The aim of this study to evaluate the results of surgical treatment of patients with lesions of the mediobasal structures of the temporal lobe (MBSTL) with symptomatic epilepsy operated via supracerebellar transtentorial (SCTT) approach.
Materials and methods: A retrospective clinical and instrumental examination is presented of 7 patients (6 female and 1 male) with refractory epilepsy. 5 patients had tumors of MBSTL, 1-

cavernoma and 1- focal cortical dysplasia. The lesions were located on left side in 4 and on the right side in 3 patients. Patients underwent surgical intervention via retromastoidal craniotomy and tentoriotomy for exposure of MBSTL.
Results: MRI and CT scan confirmed the total removal of lesions in 6 observations and partial in 1 case. Complications observed in 2 cases- transient hemiparesis and hemorrhagic infarction of the cerebellar hemisphere. The outcomes of surgery were evaluated after 6 month. 6 patients were neurologically intact, and in 1 was slight hemiparesis and in 1 was slight ataxia. Engel Outcome Scale (EOS) demonstrated- 6 patients achieved I class of EOS and 1 patient class II of EOS.
Conclusion: The supracerebellar transtentorial approach can be used in treatment of various lesions of MBSTL as minimally invasive approach without retraction of the temporal lobe. This approach reduces the frequency of severe neurological complications (aphasic disorders, motor, sensory and visual fields deficits), observed in trans-and subtemporal approaches.

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Presurgical evaluation using multimodal diagnosis: it´s predicting value for seizure outcome in MRI-negative intractable partial epilepsy

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Purpose: Today's role of MRI is established in the fact that surgery is most effective when an epileptogenic lesion can be identified preoperatively. However, postoperative seizure-freedom rate is expected to be less than 50% in MRI-negative intractable epilepsy. We evaluated the usefulness and predicting value of multimodal diagnosis for seizure outcome in patients with MRI-negative intractable partial epilepsy.
Methods: We retrospectively evaluated presurgical epileptogenic localization using multimodal diagnosis of 4 different modalities, including scalp video-EEG monitoring (SVEEG), interictal iomazenil-SPECT/FDG-PET, and interictal MEG using equivalent current dipole (ECD) analysis in 8 patients with MRI-negative intractable partial epilepsy. We compared the seizure outcome and lobar localization of presurgical examinations based on results of intracranial video-EEG (IVEEG) and the cortical resection area.
Results: Seven of 8 patients underwent IVEEG and one had temporal lobectomy guided by intraoperative electrocorticography. Five (62.5%) patients had excellent seizure outcomes (Engel class I), and 3 (37.5%) had residual seizures (2 patients had Engel class II and one had class III). The number of modalities (m) were colocalized to the results of IVEEG and cortical resection area in 2 (m=4), 1 (m=3), 1 (m=2), 2 (m=1), and 1 (m=0) patients. The remaining patient underwent 2 further modalities (ictal MEG and SISCOM) which were colocalized with IVEEG and the cortical resection area, although none of the other 4 modalities failed the epileptogenic localization. All 5 patients who achieved postoperative seizure-freedom had concordant results with at least 2 modalities preoperatively.
Conclusions: At least 2 modalities with concordant results showed good seizure outcome in patients with MR-negative partial epilepsy. Multimodal neuroimaging, including newly advanced methods and electrophysiological examinations, should be undertaken for presurgical evaluation and determining IVEEG indication, although employing vagus nerve stimulation as a surgical intervention is an option in patients not indicative of resective surgery after comprehensive evaluation.

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Surgical management of low grade brain tumors associated with medically resistant epilepsy: seizure outcome

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Objective: Controversy persists with respect to the optimal surgical procedure for patients with low grade brain tumors associated with medically intractable epilepsy.
Methods: A prospective study was designed to treat those patients presenting in the period between January 2007 and December 2011 with drug resistant epilepsy (defined as failure to attain a seizure free status utilizing adequate trials of two tolerated and appropriately chosen antiepileptic drugs, either in combination or as monotherapies). The surgical procedure consisted of a maximal resection of the tumor and any resectable surrounding associated epileptogenic cortex, identified by intraoperative electrocorticography (ECoG).
Results: Fifty four patients were operated upon and followed up for a minimum of 23 months. Thirty two tumors **(59.2%)** were located in the temporal lobe, fifteen **(27.8%)** in the frontal, and seven **(13%)** in the parietal. The histopathology confirmed low grade astrocytoma (WHO grade I or II) in **38.9%** (n=21), of patients, oligodendrogloima in **24%** (n=13), ganglioglioma in **20.4%** (n=11) and DNET in **16.7%** (n=9). Gross total tumor resection was achieved in **64.8%** (n=35) patients and subtotal in **35.2%** (n=19). There was no death and 5 cases with permenant deficit. At follow up, according to Engel's seizure outcome scale, 77.8% (n=42) of the patients had good seizure control (Classes I, II) and 22.2% (n=12) had poor control (Classes II, IV). The results show significant effect of surgery in seizure control.
Conclusion: This study emphasizes the role of maximal resection of low grade brain tumors in combination with resection of nearby epileptogenic cortex in achieving satisfactory seizure control in patients with medically intractable epilepsy.

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The treatment of foci resection and bipolar electro-coagulation on functional cortex in multifocal epilepsy associated with tuberous sclerosis complex involving eloquent cortex

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Purpose: Tuberous sclerosis complex (TSC)-associated epilepsy is medically refractory seizures secondary to cortical tubers. TSC patients are with refractory epilepsy involving eloquent and noneloquent cortex in multiple lobes and multiple independent seizure foci which made these patients poor candidates for conventional surgery. We have previously presented that the approach of pure bipolar electro-coagulation on functional cortex (BCFC) in the treatment of unifocal epilepsy involving eloquent areas is effective, safe and easy to use. This report describes our long-term follow-up for combined foci resection and BCFC in TSC patients with refractory epilepsy involving eloquent cortex.
Methods: Four patients aged from 10 to 21 years were admitted with refractory epilepsy. Cranial computed tomography (CT) and magnetic resonance imaging (MRI) revealed classic features of TSC, and met the diagnostic criteria of TSC. Initiated combination therapy of foci resection and BCFC for epilepsy management between May 2004 and May 2011, the four patients were retrospectively reviewed with regard to seizure outcome, postoperative complications.
Results: Engel class I outcome was achieved in 2 patients and Engel calss II was achieved in 2 patients. All patients were with no permanent neurological deficit noticed during a standard clinical examination.

Conclusions: The combination therapy of foci resection and BCFC is an effective and safe surgical approach for the treatment of TSC-associated epilepsy involving eloquent cortex.

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Is unilateral mesial temporal sclerosis with discordant ictal VEEG amenable to treatment?

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Temporal lobe epilepsy due to mesial temporal sclerosis (MTS) is the most common form of intractable epilepsy, where surgery is associated with good results. Common predictors of good surgical outcome have been mentioned as concordance of interictal, ictal scalp EEG recordings and unilateral MTS findings seen on magnetic resonance imaging (MRI).

Purpose: To assess the long term surgical outcome of anterior temporal lobectomy (ATL) in unilateral MTS patients, evaluated with noninvasive protocol, who present with discordant ictal VEEG onset.

Methods: This is a retrospective study undertaken at All india institute of medical sciences (AIIMS), India. A comprehensive epilepsy surgery programme is being carried out with noninvasive monitoring including interictal, ictal VEEG recordings, 3T MRI, SPECT, PET, PET-MRI fusion. 1000 epilepsy surgeries have been performed at our centre with noninvasive protocol.

Patients diagnosed with unilateral MTS on basis of MRI findings were included in the study from January 2001 to December 2006. Interictal and ictal EEG was performed during presurgical workup. Both concordant and discordant ictal onsets were recorded. Ictal and interictal SPECTs (SISCOS) and PET Imaging was performed in discordant ictal onsets. All these patients who were diagnosed as unilateral MTS on basis of MRI, underwent surgery based on noninvasive workup. Patients were followed for a minimum period of one year following surgery and outcome assessed in terms of Engel's seizure outcome, medication intake and quality of life.

Results: Out of 90 patients with unilateral MTS who underwent ATL, 14 had discordant ictal VEEG onsets. PET and SPECT studies were performed in all patients with discordant ictal onsets. All surgical patients were followed up, with mean duration of 8.2 years. Surgical outcome was good (Engel I and II) in 78% patients.

Conclusion: Patients with discordant ictal onsets with unilateral MTS have good outcome, even when evaluated by a noninvasive protocol.

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Hong Kong Regional Epilepsy Surgery Service

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Purpose: To report the results of a regional epilepsy surgery program in Hong Kong.

Method: A comprehensive epilepsy surgery program was set up in Queen Elizabeth Hospital, Hong Kong and the population served in that region is estimated to be 2 million.

The investigations are protocol driven, according to sub-classification of temporal lobe epilepsies versus non temporal lobe epilepsies.

The essential investigations include video EEG and MRI brain with designated epilepsy protocol. For non-temporal cases, ictal SPECT will be offered as supplementary investigation, and MEG &

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PET brain will be offered as indicated.
Results: From 2003 to date, we analyzed more than 200 patients from the referring sources and operated on 24 cases. The mean duration of epilepsy prior to surgery was 20.9 years. (Range: 1-46)
19 anterior temporal lobectomies were performed for temporal lobe epilepsy with various etiologies. 3 patients with either subtle or non lesional epilepsies were operated with aids of invasive EEG recording, 1 patient underwent lesionectomy and 1 patient underwent corpus callostomy. Overall, 15 (68%) among them enjoyed good surgical outcome (Engel Class I&II). 12 patients had been followed up for more than 5 years. The pathologies included 15 hippocampal sclerosis (63%), 2 developmental tumor (8%), 3 focal cortical dysplasia (13%), 3 caverous angioma (13%) and others (1%). Surgical complications were as follows: permanent, non disabling visual field loss (N=2, from temporal cases) and minor sensory ischemic stroke (N=2, from non-temporal cases).
Conclusion: The result was comparable to the international standard. Yet, taking into consideration of the local prevalence of epileptic disorder, there exist a treatment gap for the surgical treatment for refractory epilepsies. The long interval between the onset of epilepsy and the completion of surgical treatment also reflect the fairly poor awareness of this evidence-based treatment modality in our locality.

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Clinical application of MRS combined with long-term V-EEG on the surgical treatment of temporal lobe epilepsy
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Objective: To explore the application value of MRS combined with V-EEG on the surgical treatment of temporal lobe epilepsy.
Material and method: There were 31 males and 20 females, their age between 4 and 62 years. Their illness duration ranged from 4 to 10 years .The clinical manifestations showed complex partial seizure in 10 cases, partial-secondary -generalized seizure in 12, and generalized tonic-clonic seizure in 29. Based on their results of clinical manifestations, combined with MRS and V-EEG results, all the patients underwent anterior temporal lobectomy(including the most parts of the hippocampus and amydala).
Result: The follow-up of more than 1 year showed the seizure disappeared in 36 cases, and significant improvement in 11, no improvement in 4 cases. The overall effective rate is 92.16%.
Conclusion: MRS combined with V-EEG is of significant location value to temporal lobe epilepsy. The postoperative curative result is satisfactory to the patient of typical temporal lobe epilepsy after anterior temporal lobectomy (including the most parts of the hippocampus and amydala).
Keyword: Temporal lobe epilepsy; MRS; V-EEG

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What would we do with failed hemispheric disconnection?
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Purpose: Cerebral hemispherectomy achieves the best seizure and functional outcomes

among all procedures for intractable epilepsy. Residual seizures after functional hemispherectomy occur in approximately 20% of patients with catastrophic epilepsy. These episodes are traditionally attributed to incomplete disconnection, persistent epileptogenic activity in the ipsilateral insular cortex, or bilateral independent epileptogenic activity. We analyzed our series of 63 hemispherotomies to clarify and find out the reason for failure of the hemispheric disconnection procedure.

Method: There were 52 children in this series with a mean age of 10.1 years (28 days -25 years old) and mean duration of seizures of 5.7 years (20 days - 16.8 years). They had a various types of seizure. Complex partial seizures and generalized tonic seizures were most common. The seizure frequency is 5 times to 100 times per day. Preoperative diagnosis were 25 cortical dysplasia, 6 hemimegalencephaly, 11 Lennox-Gastaut syndrome, 4 diffuse cortical atrophy, 2 Ohatahara syndrome, 1 Rasmussen encephalitis, 2 schizencephaly, and 1 Sturge-Weber syndrome.

Results: Primary hemispherotomies were 61 and secondary procedures were 2. Final seizure outcomes are as follows, 41 patients were a class 1, 10 were class 2, and 1 was dead after surgery. There were 9 failures among 61 primary hemispherotomy. There was no failure in secondary hemispherotomy. The causes of failure were 4 remnant splenium and 1 of remant frontal base connection . Although the other 4 patients had no remnant connection additional lobectomy made these patients class 1. The pathological diagnoses were all severe cortical dysplasia. All 3 secondary hemispherotomy patients underwent lobectomies or cortisectomy before hemispherotomy. And the pathological diagnosis was cortical dysplasia.

Conclusion: The patients who have non-localizing epileptic focus cortical dysplasia with preoperative imaging study and are under consideration to perform hemispherotomy should be considered as the candidate for additional lobectomy during or before hemispheric disconnection.

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Clinical audit of seizure outcome and change of number of anticonvulsants after paediatric epilepsy surgery in a regional referral center in Hong Kong from 2001 to February 2014

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Purpose: To audit seizure outcome and change in number of anticonvulsants after Epilepsy Surgery from 2001 to Feburay 2014

Method: Patient with refractory epilepsy underwent pre-surgical evaluation. Suitable candidates selected for different types of epilepsy surgeries. Seizure outcome was graded by Engel Classification (Class I to IV). The change in number of anticonvulsants grouped as: Free of anticonvulsant,> 50% reduction, < 50% reduction, no change, need adding extra-anticonvulsant.

Results: Age for surgery: 7 months- 23 years (mean age:9.3 year). Follow-up duration: 2 months-13.2 years (mean duration:4.4 years).

44 epilepsy surgeries performed in 41 patients include:

19 Temporal Lobe Surgeries (11 left/ 8 right); 17 Extratemporal Lobe Surgeries (3 Hypothalamic Harmatoma; 4 Frontal; 3 Fronto-insular; 2 Fronto-parietal; 2 Parietal; 2 Parieto-occipital; 1 Occipital); 1 Temporo-Parieto-Occipital Disconnection; 1 Hemispherectomy; 3 Corpus Callosotomy; 3 Vagal Nerve Stimulator Implantation.

In 19 Temporal Lobe Surgeries, 84%/16 patients Engel Class I; 5%/1 patient Class IIB; 5%/1 EngelClass IIIA; 5%/1 Engel Class IVB. 47%/9 patients Anticonvulsant free; 10%/2 patients

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>50% anticonvulsant reduction; 16%/3 patients < 50% anticonvulsant reduction;16%/ 3 patients anticonvulsant no change: 2/10% patients needed adding extra-Anticonvulsant.
17 Extra-Temporal Lobe Surgeries done in 14 patients; 1 had 2 surgeries; 1 had 3 surgeries, 50%/7 patients Engel Class I; 14%/2 patients Class II; 28%/4 patients Class III; 7%/1 patient Class IV. 14%/2 patients Anticonvulsant free; 28%/4 patients >50%anticonvulsant reduction; 42%/6 patients anticonvulsant no change; 12%/2 patients needed adding extra-anticonvulsant.
1 patient had Temporo-Parieto-Occipital Disconnection Engel Class I, >50% anticonvulsants re-duction;
1 patient had Hemispherectomy Engel Class IVB.
3 patients corpus callosotomy decreased drop attack.
2 out of 3 patients improved after VNS: 1 patient decreased seizure frequency and duration; 1 patients decreased duration of post-ictal drowsiness.
Conclusion: Patients underwent Temporal Lobe Surgeries had better seizure outcome, more anticonvulsant reduction compared those underwent Extra-temporal Lobe Surgery.

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Deep brain stimulation of anterior thalamic nuclei for intractable epilepsy in Thailand: first case report with preliminary results

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Neurostimulation can be an alternative treatment medically intractable epilepsy especially when the resective surgery could not be performed. The author reported a case of 19-yr-old, right-handed male patient who had a history of chronic intractable epilepsy after post viral encephalitis associated with status epilepticus for 11 years. He also had small arteriovenous malformation at left temporal pole resection 2 years earlier. Because of his disabling seizures, he had underwent subdural electrodes evaluation and followed by left mesial frontal resection and standard temporal lobectomy. The pathology revealed encephalomalacic change of left a mygdala and gliosis of hippocampus. Unfortunately, the seizures recurrent occurred after 6 months of surgery.
Persistent interictal spikes were observed at posterior temporal area (T3). Further resection on left dominant hemisphere was not recommended because of the higher risks of neurological deficit and history of status epilepticus. Anterior thalamic deep brain stimulation(DBS) was performed. Indirect targeting of anterior thalamic nuclei can not be used because of asymmetric brain shift from previous resections. Direct targeting of anterior thalamic nuclei from MRI T1, STIR sequence combination with microelectrode recording were used as a technique for implantation of DBS electrodes (3389). Post operative MRI revealed good electrodes positioning. The stimulation was turned on with 145 Hz, pulse width 90 microseconds, 3.5 volts with cycling mode 1 minute “on” and 5 minutes “0ff”. The antiepileptic medications continued the same as pre operative state. Fifty percent seizure reduction was achieved in 4 months after surgery.
Early results revealed anterior thalamic DBS can be performed safely with satisfactory seizure outcome. Direct targeting of anterior thalamic nuclei combination with microelectrode recording can be very helpful especially when asymmetric basal ganglion structures were detected. Neurostimulation is another option for complete comprehensive epilepsy surgery center except from standard resective surgery care.
Keywords: Anterior thalamic DBS, medically intractable epilepsy, neurostimulation

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Location diagnosis and function mapping used in medically eefractory epilepsy surgery

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Purpose: To obtain further security and validity of epilepsy surgery by discussing the methods and outcome of location diagnosis and surgery for 255 patients.
Method: Located the epileptogenic cortex by long time V-EEG monitoring and MRI, PET, or MSI scans of brain. If scalp EEG monitoring failed to determine the location of the epileptogenic cortex, placed electrodes directly on the brain surface (subdural electrodes) or in the brain (depth electrodes). Electrical brain stimulation identifed the location of vital brain regions (function mapping).Then some removed surgery was operated.
Results: Location diagnosis for most of the patients are accurate and the effects of surgery were good. The efficiency rate was 94.12%.
Conclusion: Long time V-EEG monitoring with MRI can accurately locate the seizure focus of most of the patients. For seizure focus in function area, using cortex electrodes monitoring can mostly excise the seizure focus and protect the function of the brain.

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Anterior temporal lobectomy for temporal lobe epilepsy causing contralateral occipital hematoma

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Purpose: Postoperative hematoma is very common complication of craniotomy and often may lead to death in severe cases. The post-resection cavity is often seen as the most common location for the hemorrhage. In this case, we report an acute occipital hematoma that occurred after contralateral anterior temporal lobectomy was performed in our center, which is rare comparing with the previous literatures.
Method: We herein report 35-yrs old male patient presented with epilepsy for 10 years. The pre-operative MR imaging revealed sclerosis of the right hippocampus. An ipsilateral anterior temporal lobectomy was performed, after 20 hours the patient developed symptoms like severe headache, somnolence and left limbs hemiplegia. An emergence CT scan showed an acute right side occipital hematoma and emergence craniotomy were performed to remove the hematoma. The cerebrospinal fluid excessive drainage intro and post-operation were considered as the risk factors for this remote area intracranial hematoma.
Results: After the hematoma surgery, the patient´s headache and hemiplegia were apparently alleviated, and the postoperative CT confirmed that the hematoma had been removed with no active bleeding. At one year follow-up, the patient's seizure control reached Engle Class IA, characterized no seizures or auras after the surgery. He is on Lamotrigine 200mg per day until now. Postoperative memory improved tremendously and no visual field or visual acuity defect has been found.
Conclusion: Cerebrospinal fluid excessive drainage should be avoided in the patients with anterior temporal lobectomy, and when a patient presents with impairment of consciousness, severe headache or any newly neurological dysfunction, an emergency cerebral CT scan needs to be performed immediately to discover intracranial hematoma.

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Effects of Guanfacine on acute kindling-induced afterdischarges in the rabbit hippocampus CA1

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Purpose: Hyperpolarization-activated and cyclic nucleotide-gated (HCN) channel is one of the possible targets of anti-epileptic drug. Guanfacine can decrease the intracellular level of cyclic adenosine monophosphate (cAMP) resulting in closing HCN channels and pass through blood-brain barrier. In this study, we examined the effect of guanfacine on afterdischarges (ADs) induced by acute kindling of the rabbit hippocampus to reveal the contribution of HCN channel in epileptogenesis.

Method: We performed all experiments under appropriate conditions in accordance with the Declaration of Helsinki (revised version in 2000) and the Guide for Animal Experimentation at Soka University. Seventeen adult rabbits were used. Under deeply anesthesia and artificial respiration, we delivered stimulations (1 msec, biphasic 50 Hz, 1 sec train) with suprathreshold intensity for AD at 20-min intervals to the right hippocampal CA1 region. Spectral analysis on each AD was performed with sampling frequency of 1 kHz by Power Lab (Chart, ADInstrument). The kindling stimulations were performed at least 30 times unless alteration of frequency component of ADs shown in chronic kindling experiment (Komei T et al. Epilepsy Res. 2011; 95:144-151). In kindled condition, several doses (1 mM, 3 mM and 5 mM: 100 µl/1 min) of guanfacine or saline (100 µl/1 min) were administered directly to the right hippocampus.

Results: The 1 mM guanfacine application delayed the onset of AD occurrence but could not suppress the AD generation. In contrast, 3 mM as well as 5 mM guanfacine prevented AD occurrences at 16.7% and 70.7%, respectively. Additionally, 5 mM guanfacine application significantly increased AD threshold to 16.3 times (p=0.053).

Conclusion: Since guanfacine inhibited occurrences of AD with a dose-dependency and increased AD threshold, guanfacine could be a candidate for a new AED. It is suggested that HCN channel might be involved in AD occurrence.

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Utilization of bone marrow mesenchymal stem cells for therapeutic model of epilepsy

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Purpose: This research is aimed to observe the effect of giving different dosages and approach of bone marrow mesenchymal stem cell (bMSCs) for regenerate the damage of hippocampal area caused by seizure in epilepsy model animals.

Method: This study uses 36 Spraque Dawley rats, development of animal group model, injected with bicuculine 8mg/kg, intraperitoneally, and at day-7 received bMSCs injection, each using 3x2x105 Intravenous, 1x5x106 Intravenous, neuron progenitor at 1x2x106 intravenous and neuron progenitor at 1x2x105 intracerebral.

The bone marrow was aspirated from rats femur and tibia, after anaesthetized using Ketamin 10mg/kg and Xylazin 2mg/kg. The aspirated bone marrow was centrifuged at 200G for 30 minutes at 25°C + Ficoll Plaque. The cells were cultured in α Modified Eagle media (Gibco, USA) + Pencillin 50U/ml, Streptomycin 50 mg/ml and fetal bovine serum (FBS) 10%, and incubated at 37°C and 5% CO2. CD 44, CD 45 and CD 105 were used to identify marker the mesenchymal stem cell. For further culture, to get the cell-like neurons, 0,02 mM β-mercaptoethanol (βME),

10ng basic fibroblast growth factor (bFGF) and 10ng epidermal growth factor (EGF) were added to the mesenchymal stem cell culture. After 7 days, cell-like neurons appeared and identify marker neuron cell nestin and β aktin.Cell cultured were confluenced 80% at 7th day of treatment dan after 4 weeks cell counted 20.000 cells/cm2.
Results: This study showed intravenous administration of MSCs low doses repeatedly gave a better regenerate hippocampusthan the high dose at once and giving progenitor neural stem cells
Conclusion: Regenerate hippocampus must be done repeatedly to resolve tissue damage due to limited ability of exogenous stem cells survive longer in the brain tissue and depending microenvironment where stem cells are like nutrients , growth factors , trophic factors and cytokines produced MSCs

Women and pregnancy

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The challenges in choosing an anti epileptic drug for women at marital age in my neurological practice
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Purpose: In women at marital age, the main challenge is side effect profile of an AED , planning marriage and pregnancy. It is important to look for side effects and plan marriage/pregnancy well in advance.
Method: Fifty women in the age range 18 to 25 years who are unmarried, under my care for epilepsy for past 3 years are taken for the study. Thirty are new patients and twenty are patients referred already under medications.
Results: Thorough clinical history was taken from all the thirty new patients. Epilepsy sub classification was documented. Patient and family were counselled regarding the seizure. They are asked to discuss with the clinician regarding the marriage well in advance as the drug has to be planned accordingly.
Twenty patients who are referred already under medications are thoroughly analysed. Their type of epilepsy, drug history and side effect profile are documented . The patient and family are encouraged to discuss regarding marriage well in advance.
All thirty new patients the drugs are chosen, which has safety features and all are prescribed in addition folic acid tablets
The twenty patients who are already on medications doing well with safer medications are left undisturbed. The remaining patients who are taking medications with higher risk during pregnancy are slowly shifted to safer appropriate drug over a period of time.
All are prescribed folic acid tablets regularly.
Conclusion: The main problem in women at marital age belonging to different socio economic status/educational background are multiple. Poor follow up, lack of awareness of side effects, changing between different health systems and not planning marriage/pregnancy well in advance. Correcting all the above factors made significant difference in all the above patients.

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Intermittent levetiracetam treatment in five patients with catamenial epilepsy
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Purpose: To summarise clinical outcomes in five patients with catamenial epilepsy who received

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intermittent treatment with levetiracetam (LEV).
Method: Five patients attended the epilepsy outpatient clinic at the Sichuan Provincial People's Hospital. Clinical information was obtained from medical records and by patient interview. Five patients received intermittent LEV treatment 1 week prior to and post-menstruation around each menstrual period. All of them underwent regular 3-, 6- , and 12-months of follow-up.
Results: Five patients responded positively to intermittent LEV treatment. Catamenial seizures were controlled with a dose of 0.5g, twice daily in 3 of these patients, and by a dose of 0.75g, twice daily in the remaining 2 patients.
Conclusion: Intermittent LEV therapy could be an effective strategy for the treatment of catamenial epilepsy.

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Treatments and behaviors of pregnant women with epilepsy in West China
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Purpose: Seizures and antiepileptic drugs may affect fertility and pregnancy outcomes in women with epilepsy (WWE). Standardized treatments and appropriate guidance are important during pregnancy. There is no research on present status of treatment compliance among pregnant WWE in China. This study aimed to survey the current status of treatments and behaviors among pregnant WWE in West China and to find out the possible clinical and social factors which may be associated with the treatment gap among these patients.
Method: During November 2013 to March 2014, we conducted the multicenter survey in four hospitals in West China. All adult women suffering epilepsy before pregnancy were prospectively or retrospectively enrolled in our study. We collected their treatment and behavior conditions every three months during pregnancy. Logistic regression was used to analyze the potential factors associated with pregnancy.
Results: 103 pregnant WWE were involved in our survey. 37 of them were unplanned pregnancy. 19 prepared for pregnancy after seizures had been controlled. Just 10 took folic acid from 3 months before pregnancy to the second trimester. 38 patients stopped AEDs therapy once pregnancy was announced without consulting the specialist until the baby was born worrying about the drug adverse effects. 56 of the total respondents didn't known that the fetus may be at relatively higher risk of harm during tonic-clonic seizures. 22 were afraid of the drug side effects and ever underwent induced abortion without any prenatal examination or consulting the specialists. 17 had suffered from spontaneous abortion because of the bad conditions of fetus. And the information on pregnancy is still updated.
Conclusion: This study showed that a considerable proportion of patients lack standard treatment and appropriate guidance during pregnancy. More scientific and comprehensive managements should be carried on for women with epilepsy and pregnancy in West China.

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Late abstracts

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Effect of exercise on histology of hippocampal dentate gyrus in kindled rats

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Background: Controversial results were reported on the effect of exercise on the histology of hippocampal dentate gyrus (DG) in pentyleneterazole-(PTZ) kindled animals. The purpose of this study was to examine the effect of physical exercise on the histology of hippocampal DG in kindled rats.

Materials and methods: In this experimental study, 40 adult male Wistar rats were randomly divided into four equal groups: control without exercise, PTZ without exercise, control + exercise and PTZ + exercise groups. After a 6 week-period training, the rats were deeply anesthetized and sacrificed and then their brains dissected out and fixed in formalin (10%). After tissue processing and sectioning, the samples were stained. An immunohistochemical method was used to determine the rate of cell death in hippocampal neurons.

Results: Results showed that a 6 week-period training significantly increased the mean number of normal cells in DG in the PTZ + exercise group compared to the PTZ without exercise group. Moreover, the mean number of normal cells in DG in the control + exercise group was significantly increased compared to the control without exercise group. The rate of cell death of DG neurons in PTZ groups was increased significantly compared to the other groups.

Conclusion: Experimental seizure using PTZ-kindling method can decrease the number of normal cells in DG neurons of hippocampus, while exercise delays the morphological changes of DG cells.

Keywords: PTZ, Exercise, Hippocampus, Rat, Epilepsy

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The effect of minocycline on gene expression of GABAA receptor in hippocampus and piriform brain areas on amygdale kindling acquisition in rat

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Introduction: Minocycline has anticonvulsant effects. Since some antiepileptic drugs increase the neurotransmitter GABA in the brain, the aim of this study is the effect of minocycline on gene expression of GABAA receptor in hippocampus and piriform brain areas on amygdale kindling acquisition in rat.

Methods: In this experimental study, three group animals (24 Wistar rats), after sterotaxic surgery and 1 week recovery period, rats received kindling stimulations (twice daily at 6 hour interval). Group 1(n=8) animals did not received daily kindling stimulations. Group 2 (n=8) and 3(n=8) 60 min before kindling stimulation received saline (1ml/kg) and minocycline (25 mg/kg) respectively. Two hour after the last stimulation animal's brain was removed and the changes of gene by $\gamma 2$ subunit of GABAA receptor in the hippocampus and piriform cortex was measured and compared relative to control group. Data was analyzed using ANOVA and Tukey post hoc tests at significant level P< 0/05.

Results: In group 3 intraperitoneal administration of minocycline for 10 days reduced cumulative ADD significantly reduced relative to control group (group 2) (P< 0.001). It also significantly increased the mean number of stimulations to achieve to seizure stages of 4(P< 0.01) and 5 (P<

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0.001). In addition, injection of minocycline before kindling stimulations removed the electrical stimulation induced increase in mRNA of γ2 subunit of GABAA receptor in hippocampus and piriform cortex of amygdale kindling.
Conclusion: The results of this study showed minocycline administration before electrical stimulation affects on seizure parameters and this effect occurs via reducing GABAA receptors.
Keywords: Epilepsy, Kindling, Minocycline, GABAA receptor.

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Pyridoxine dependent seizures in Oman
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Purpose: Majority of the children with pyridoxine dependent seizures (pds) present in infancy, particularly in neonatal period with refractory status epilepticus. Early recognition is important for the diagnosis and good outcome in such children. Pyridoxine dependent seizures are still missed in children with epilepsy.
Method: All the children diagnosed with pyridoxine dependent /responsive seizures over last sixteen years were collected prospectively. Majority of the children had refractory status epilepticus in the neonatal period requiring intensive care unit admission. The diagnosis was based on complete cessation of seizures on pyridoxine (intravenous/oral) and EEG normalization. One child responded partially to pyridoxine and later to pyridoxal phosphate.
Results: Twenty-three children with pyridoxine dependency and pyridoxine responsive seizures were seen. Fifteen children had pyridoxine dependent seizures and eight pyridoxine responsive seizures. The pyridoxine responsive seizures were the children that required combination of pyridoxine and antiepileptic medications. Withdrawal of either resulted in breakthrough seizures. Nine children with pds were seen in three families and rest were sporadic cases. All children were taking pyridoxine except one on pyridoxal phosphate (pds group). Most of the children are on follow up at our institution. The common mutation of ALDH71 gene was not seen in our children. Genetic work up is underway in two families.
Conclusion: Recognition of pds is important for all clinicians dealing with seizures in children. Any refractory seizures in infancy should be given pyridoxine trial.
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The correlation between variables with epilepsy patients cognitive function in Neurology Outpatient Clinic Dr M Djamil Hospital Padang
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Background: Cognitive deficit characterizes damage of intellectual abilities that manifest themselves in the form of disorientation in time and space, impaired attention and memory, inability in recognizing, judging and reasoning, and impairment of complex intellectual abilities such as analyzing and using information. Therefore, many epilepsy patients might suffer cognitive function deficits that affect their life quality.

Objective: This study aims to identify the correlation between variables and cognitive function in epilepsy patients that attend neurology outpatient clinic in Dr M Djamil Hospital Padang.
Methods: A cross sectional study was conducted at neurology outpatients clinic Dr M Djamil Hospital, from December 2013 to April 2014. The qualified Epilepsy patients undertook a cognitive function assessment conducted by using MoCA-Ina. Results were presented in categorical variables. The correlation between cognitive function and other variables were analyzed using Chi Square with $P < 0.05$ significance.
Results: There are 54 patients included in this study. The mean age are 33,7 years ± 14,76 years. Seizure type were tonic clonic (43 patients,79,6%), tonic (7 patients,13%), and absence (4 patients,7,4%). Type of AED were fenitoin (22 patients, 40,7%), carbamazepin (16 patients, 29,6%), valproic acid (4 patients, 7,4%) and multidrug AED were 12 patients (22,2%). Educational background is, 14 patients graduated from elementary school, 8 patients were graduated from junior high, 22 patients were graduated senior high and 10 patients have university degree. The finding is that 75, 9% of the patients have cognitive deficits. After statistical analysis, we found that there is no significant correlation among age, gender, educational background, seizure type and AED with cognitive deficits. Further analysis reveals that there are significant correlation between attention ($P < 0.05$) and delay memory ($p < 0.05$) with seizure type.
Conclusion: There is no significant correlation between these variables with cognitive function.

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Characteristic of serum prolactine in uncontrolled epilepsy patient
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Background: Prolactin is secreted from the anterior pituitary gland and is inhibited by tubero-infundibular dopamine neurons in the arcuate nucleus of the hypothalamus. Abnormal electrical discharge passing through the hypothalamus may disrupt the normal functioning. Generalized neuronal discharge of a seizure stimulates the hypothalamus, causing increase in serum prolactin level during epileptic form of seizures. Acute changes in serum prolactin levels which occurred following some of the seizures may be useful in differentiating epileptic seizures from psychogenic non epileptic seizures.
Objectives: This study was aimed to describe the characteristic of serum prolactine in uncontrolled epilepsy patients and to distinguishing the true epileptic seizures from psychogenic non epileptic seizures.
Methods: The prolactin levels will be examined using ELISA method, by taking as much as 1 cc of the patients venous blood. The data will be presented with distribution table.
Results: In this study, there were 11 uncontrolled epilepsy patients (7 male and 4 females). Most of the patients (7 patients) are aged > 11 years old. Generalized Tonic Clonic Seizure (GTCS) are the most type of seizures (6 patients). There were 2 patients with laps measure of time < 2 hours of onset, resulting higher prolactine levels than normal. However, their prolactine levels are considered within normal since prolactinemia were considered high if values were greater than 23 ng/ml or two times more than the base line value.
Conclusion: Maximum elevation of prolactin is seen within 15 to 30 minutes post ictally, then reduce and back to normal after 2 hours. The prolactin test with laps time measure more than 2 hours, loses its significance and can not be used to differentiate true epileptic event from other events. As it is not always possible to obtain a sample within the period of maximum elevation, differentiate type of seizure and distuingishing psychogenic non epileptic seizures, Video-EEG monitoring or family documentation are recommended.

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An unblinded, randomized multicenter clinical trial comparing lamotrigine and valproate combination therapy with controlled release- carbamazepine monotherapy as the initial drug regimen for patients with untreated epilepsy

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Objective: To compare the effectiveness of controlled-release carbamazepine (CBZ-CR) monotherapy with Lamotrigine and Valproate combination (LTG+VPA) therapy as the initial drug regimen in patients with partial seizures (PS) and/or generalized tonic-clonic seizures (GTCS).

Methods: This unblind, randomized, 60 week superiority trial recruited patients with 2 unprovoked seizures with at least one seizure during the previous 3 months. Patients were randomized into CBZ-CR or LTG+VPA and entered into the titration phase (TP) of 8 weeks, which was followed by 52 weeks of maintenance phase(MP). Primary outcome measure was completion rate of the study as planned(60weeks). Secondary efficacy measures included seizure free rates (SFR) and time to first seizure.

Findings: Two hundred and two patients were randomized into CBZ-CR (n=105) and LTG+VPA(n=98). Completion rates of the entire study(60 weeks) were not different between the two groups(62.5% in CBZ-CR and 65.3% in LTG+VPA, P=0.68). Among patients entered to the MP, SFR for 24 weeks of MP was 92.2% in CBZ-CR (n=90) and 93.6%% in LTG+VPA(n=78), which were not different (p=0.76). SFR of the whole 52 weeks of MP were 64.4 % in CBZ-CR and 79.5% in LTG+VPA(P=0.09). SFR for 24 weeks at initial target dose were 68.9% in CBZ-CR and 85.9% in LTG+VPA, which was significantly in favor of LTG+VPA (p=0.031). Time to first seizure after TP was also in favor of LTG+VPA(P=0.038). A similar proportion of patients in the CBZ-CR (60 of 104 patients; 57.7%) and LTG+VPA(59 of 98 patients; 60.2%) groups experienced at least one AE during the treatment period, with most events being of mild or moderate intensity. Tremor was more frequent in LTG+VPA, which was statistically significant (p=0.007). Fatigue and ataxia were more frequently reported in CBZ-CR without a statistical significance. Skin rash was developed in 7 patients of CBZ-CR and 6 patients of LTG+VPA and caused early withdrawl from the study in 6 patients and 2 patients, respectively. Thirteen patients of CBZ-CR and 7 patients of LTG+VPA discontinued the study drug prematurely due to emergence of AEs.

Conclusion: LTG+VPA combination therapy was not more effective than CBZ-CR monotherapy as the initial drug regimen in patients with untreated epilepsy. However, SFR for 24 weeks of MP at initial target dose was higher and the time to first seizure was longer in LTG+VPA than CBZ-CR. The overall incidences of AEs including skin rash were comparable between the two groups. The study suggested that LTG+VPA combination therapy is a viable option to consider as the initial therapy for patients

willing to take once a day dosing or patients requiring non-enzyme inducing drugs.

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National Epilepsy Surgery Support Activity (NESSA)

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While there are over one million people with drug-resistant epilepsy in India, today, there are only a handful of centers equipped to undertake presurgical evaluation and epilepsy surgery. The only solution to overcome this large surgical treatment gap is to establish comprehensive epilepsy care centers across the country that are capable of evaluating and selecting the patients for epilepsy surgery with the locally available technology and in a cost-effective manner.

The National Epilepsy Surgery Support Activity (NESSA) aims to provide proper guidance and support in establishing epilepsy surgery programs across India and in neighboring resource-poor countries, and in sustaining them. NESSA will endeavor to establish at least one comprehensive epilepsy surgery program in each state of India by 2020.

NESSA will strive to achieve these two objectives; (1) to help willing professionals in initiating, establishing, and sustaining comprehensive epilepsy surgery programs across India and (2) to form a national network of professionals for the management of most difficult cases of epilepsy in India and for continuing epilepsy education.

NESSA is planning to achieve these two objectives by (1) providing first hand advise on initialing and establishing epilepsy monitoring units, (2) helping in selecting patients for epilepsy surgery, (3) helping in the initial epilepsy surgeries, (4) establishing the national epilepsy network, (5) by developing a website which will provide information about the activities of NESSA and where willing professionals can interact with NESSA team.

Potentially this model can be replicated in countries with similar socio-economic background.

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Spectrum of peadiatric epilepsy surgery at NIMHANS, Bangalore, India

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Purpose: Epilepsy surgery in children is unique by different etiologies, influence of ongoing seizures and pathological substrate on the developing brain and cognitive skills, difficulties in functional studies and intra operative assessment.

Method: Case records of children (1-18 years) who underwent surgery for drug resistant focal epilepsy during the past five years at NIMHANS, Bangalore were analysed for this study. These children underwent standardized presurgical evaluation, including clinical, electrophysiological, imaging and neuropsychological asessments. SPECT/ PET/MEG were done when indicated.

Results: Between 2008 and 2013, fifty five children underwent surgery for drug resistant focal epilepsy. The age ranged from 2-18 yrs (mean: 12.8 years). Twenty one children were diagnosed to have mesial temporal sclerosis and underwent ATL and AH. Lesionectomy was performed in 21 patients with intra operative electrocorticographic guidance. Focal cortical dysplasia was the commonest lesion followed by tumors, gliosis and calcification. 10 patients underwent disconnection surgeries; hemispherotomy (n=8) and posterior quadrant disconnection (n=2). Three patients underwent invasive EEG recording and surgery based on the invasive EEG findings. Among children with MTS, Engel´s class A outcome was noted in 72% patients. Among children who

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underwent lesionectomy, 60.7% had Engel's class A seizure free outcome, 21.4% had Engel's class B outcome. 85.7% of Patients with DNET demonstrated the best seizure free outcome (85%), while gliosis had relatively poor outcome (25% class A outcome). Special issues noted in management included inability to perform awake surgeries in very young patients, difficulties in obtaining functional MRI studies. Disconnection surgeries resulted in seizure control in 7 out of 10 patients.

Conclusion: Pediatric epilepsy surgery presents with issues which need special consideration during management. The etiologies and pathological substrtaes are unique and significantly different compared to adults. Surgery cures or controls seizures in a majority of children with substrate positive drug resistant focal epilepsy.

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