HIGHLIGHTS FROM INTERNATIONAL NEUROSCIENCE MEETINGS

10th European Congress on Epileptology London, United Kingdom, 30 September - 4 October 2012

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The following syllabus presents abstract highlights from the 10th European Congress on Epileptology, which took place in London, United Kingdom from 30th September to 4th October 2012.

Meeting Highlights

Genetics and basic sciences

Screening for SYNGAP1 mutations in patients with non-syndromic ID and epilepsy with myoclonic absences or myoclonic astatic epilepsy

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They report the second patient with epilepsy with myoclonic absences (EMA) and SYNGAP1 mutation adding more evidence to SYNGAP1-dysfunction as a cause of EMA. In this study, they detected the first patient with an inherited SYNGAP1 mutation and mosaicism in a mildly affected parent.

Severe functional defects of the Kv7.2 Channel caused by mutations associated with epileptic encephalopathies

S. Maljevic*, M. Bock*, G. Orhan*, D. Shepers*, S. Weckhuysen†, S. Mandelstam‡, A. Suls§, I. E. Scheffer¶, P. De Jonghe**, and H. Lerche*. *Hertie Institute for Clinical Brain Research, Tuebingen, Germany; †University of Antwerp, Antwerp, Belgium; ‡Florey Neurosciences Institutes, Austin Health, Melbourne, Australia; §University of Antwerp, Wilrijk, Belgium; ¶Royal Children's Hospital, Parkville, VIC, Australia; and **Neurogenetics Group, Antwerp, Belgium

Whereas haploinsufficiency of Kv7.2 presents the major pathomechanism of Benign Familial Neonatal Seizures (BFNS) with only a few mutations exhibiting a dominant-negative effect, the electrophysiological findings indicate dramatic functional deficits for the majority of the epileptic encephalopathy mutations, which could present a plausible explanation for the more serious clinical phenotype.

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Prospective study of POLG1 mutations presenting in children with intractable epilepsy-prevalence and clinical features

J. Uusimaa*, J. Poulton*, V. Gowda†, T. Mcshane†, C. Smith†, J. Evans†, A. Shrier*, Y. Rajabally‡, M. Narasimhan‡, A. O'Rourke†, F. Cowan§, and C. Fratter†. *University of Oxford, Oxford, UK; †Oxford University NHS Trust, Oxford, UK; ‡Leicester Royal Infirmary, Leicester, UK; and §Imperial College, London, UK

The authors recommend POLG1 gene testing for patients with intractable seizures and >1 raised CSF lactate or suggestive brain MRI changes (with thalamic predominance) with or without status epilepticus, epilepsia partialis continua or liver manifestations typical for Alpers disease, especially when the disease course is progressive.

Inflammatory process and mesial temporal lobe epilepsy with epilepsy: the role of IL-1β

J. Chaves*, C. Brito†, B. Leal†, C. Carvalho†, A. Bettencourt†, R. Branco†, A. Martins Da Silva†, P. P. Costa†, and B. Martins Da Silva†. *Hospital de Santo Antonio, Centro Hospitalar do Porto, Porto, Portugal; and †Instituto Ciencias Biomedicas Abel Salazar, Porto, Portugal

The data suggests that -511T allele may be a susceptibility factor to mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS), independently of febrile seizure (FS) antecedents. The exacerbated inflammatory reaction associated with this allele could lead to cell loss and progression of seizures. These observations must be confirmed in a higher cohort.

NMDAR1 expression in the temporal lobe from intractable epilepsy patients

Z. Wang, W. Lin, and L. Lu. The First Hospital of Jilin University, China

Expression of NMDAR1 in the temporal lobe from intractable epilepsy patients was higher than the control group.

Excitatory amino acid transporter-1 expression in human mesial temporal lobe epilepsy with hippocampal sclerosis

B. Leal*, R. Branco*, R. Rangel†, A. Bettencourt*, C. Carvalho*, J. Chaves†, A. Santos††, T. Magalhaes††, M. Honavar§, M. Melo Pires†, A. Martins Da Silva†, P. P. Costa*, and B. Martins Da Silva*. Instituto Ciencias Biomedicas Abel Salazar, Porto, Portugal; †Hospital de Santo Antonio - Centro Hospitalar do Porto, Porto, Portugal; ††Instituto Medicina Legal - Delegacao Porto, Portugal; and §Unidade Local de Saude Matosinhos – Pedro Hispano, Matosinhos, Portugal.

The results demonstrate that the glutamatergic pathway is altered in the hippocampus of mesial temporal lobe epilepsy with hippocampal sclerosis (MTLE-HS) patients. Additionally, EAAT1 (excitatory amino acid transporter 1) over expression in the adjoining cortex suggests that this area could be involved in disease progression. The EAAT1 over expression could be explained by a compensatory mechanism to overcome the accumulation of glutamate in epileptic focus.

The risk of seizures in progressive multiple sclerosis

O. W. Howell*, R. Nicholas†, D. Gveric†, M. I. Rees*, F. Roncaroli†, and R. Reynolds†. *Swansea University, Swansea, UK; and †Imperial College London, London, UK

The analysis suggests that seizure occurrence in multiple sclerosis is influenced by disease course and likely reflects the accumulation of myelin and neuroaxonal damage in the cortex.

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Evoked high frequency oscillations in the human hippocampal formation

D. Fabo*, E. Toth†, A. Sakovics*, L. Eross††, and I. Ulbert§. *Natl. Institute for Neuroscience, Budapest, Hungary; †Peter Pazmany Catholic University, Budapest, Hungary; ††National Institute of Neuroscience, Budapest, Hungary; and §Institute for Psychology, Hungarian Academy of Sciences, Budapest, Hungary

The cortical electrical stimulation intracortical evoked potentials (iEPs) contain an abundant amount of ripples and fast ripples. The evoked ripple activity raises questions about the long-term effects of cortical electrical stimulation (CES) in the temporal lobe.

Gabaergic excitatory mechanisms are involved in the genesis of epileptic activities in the cortex surrounding glioma in humans

G. Huberfeld*, J. Pallud*, M. Levanquyen†, M. Baulac††, F. Bielle†, C. Duyckaerts††, F. Roux§, R. Miles*, and L. Capelle††. *CRICM - UPMC - INSERM - CNRS, Paris, France; †Hopital de la Pitie-Salpetriere, Paris, France; ††CHU Pitie-Salpetriere, Paris, France; and §CH Ste Anne, Paris, France

The epileptic activities sustained by excitatory effects of GABA, as those reported in human temporal lobe epilepsies, suggest that cellular chloride regulation processes affecting oncogenesis are involved in the excitatory/inhibitory imbalance causing epileptic activity in peritumoral tissue.

Epilepsy surgery

Resective epilepsy surgery for malformations of cortical development in infancy and early childhood

T. Otsuki, A. Takahashi, T. Kaido, Y. Kaneko, R. Honda, K. Sugai, E. Nakagawa, and M. Sasaki. National Center of Neurology and Psychiatry, Tokyo, Japan

Favorable surgical prognosis can be obtained by respective epilepsy surgery for children in infancy and early childhood when epileptogenic pathology is demonstrated by MRI and/or functional brain imaging.

Seizure outcome ten years after resective epilepsy surgery - a population-based, prospective, longitudinal study

A. Edelvik*, B. Rydenhag*, R. Flink†, and K. Malmgren*. *Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden; and †Uppsala Akademiska Hospital, Uppsala, Sweden

In this prospective population-based study, the percentage of patients who were seizure free the year before follow-up was stable 10 years after epilepsy surgery, compared to the two years' follow-up. However, the percentage of patients with sustained seizure freedom after surgery declined over time.

Usefulness of positron emission tomography in decision making for epilepsy surgery

C. Rathore*, J. Dickson†, P. Ell†, and J. Duncan††. *Sree Chitra Institute of Medical Sciences and Technology, Trivandrum, India; †University College London Hospitals, London, UK; and ††National Hospital for Neurology and Neurosurgery, London, UK

In ~45% of presurgical patients with normal or discordant MRI, PET scan provided information that helped decision making.

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Efficacy of vagus nerve stimulation in 28 consecutive patients with treatment resistant epilepsy not eligible for epilepsy surgery

F. Dainese*, G. Randazzo†, G. Pauletto††, F. Paladin*, C. Lettieri††, C. Conti§, M. Skrap††, L. Comelli††, A. Volzone†, and P. Bonanni†. *SS Giovanni e Paolo Hospital, Venice, Italy; †IRCCS Eugenio Medea, Conegliano (TV), Italy; ††SM della Misericordia Hospital, Udine, Italy; and §Dell'Angelo Hospital, Mestre (VE), Italy

Vagus nerve stimulation (VNS) is a safe and effective palliative treatment option for refractory epilepsy (RE) not eligible for epilepsy surgery. Interestingly the data show that VNS is an effective treatment not only in cases of epilepsy with structural or unknown etiology but also in cases of epilepsy due to a specific genetic cause such as Dravet Syndrome and Angelman Syndrome.

Long-term outcome of resective surgical procedures in adult patients with refractory epilepsy-the Kork series

A. M. Staack*, A. Wendling*, I. Wisniewski*, J. Scholly*, S. Bilic*, C. Kurth*, U. Kraus*, J. Saar*, B. Oehl†, D. Altenmuller†, T. M. Freiman†, A. Schulze-Bonhage†, J. Zentner†, G. Reinshagen*, and B. J. Steinhoff*. *Kork Epilepsy Centre, Kork, Germany; and †Epilepsy Centre, University of Freiburg, Freiburg, Germany

With 62% (OC1) to 67% (OC2) seizure-free patients, the study shows satisfying long-term outcome results over more than six years. The best results were seen in lesional temporal lobe epilepsy, whereas MRI-negative epilepsy was associated with a less favorable outcome in line with the literature.

Infantile spasms as the unique seizure type in hemispheric epilepsies related to perinatal middle cerebral artery stroke – outcome following hemispherotomy

C. Bulteau, D. Taussig, M. Chipaux, M. Fohlen, G. Dorfmuller, S. Ferrand-Sorbets, and O. Delalande. Fondation Rothschild, Paris, France

Isolated infantile spasms can be a presentation of hemispheric epilepsy related to a post-ischemic lesion. Efficiency of hemispherotomy to control seizures is very high and can prevent mental retardation. Predictive factors for a favorable post-operative development remain to be studied.

The contributions of MEG in surgical decision making of lesional epilepsy

J. P. Blount*, C. B. Smith†, R. C. Knowlton†, H. Kim†, M. Goyal†, C. J. Rozzelle*, P. Kankirawatana†, and K. O. Riley†. *Children's of Alabama/University of Alabama at Birmingham,, USA; and †University of Alabama at Birmingham, Birmingham, USA

Magnetoencephalography (MEG) contributes to surgical decision making in lesional epilepsy. Extra-operative utilization includes conventional localization of diploles to localize ictal onset, localization of epileptogenesis beyond the lesion and by allowing study of tissue that is difficult to study with other functional imaging modalities. Intra-operative utilization includes fusion with frameless navigation systems allowing guidance of IC-EEG electrode placement with greater accuracy. Outcome is not directly impacted by MEG incorporation but surgical approach often is.

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Intracranial EEG ictal onset frequency: high or low?

J. Chung*, U. Maoz†, N. Tsuchiya††, O. Tudusciuc†, S. Ye†, A. Mamelak*, and D. Eliashiv*. *Cedars-Sinai Medical Center, Los Angeles, USA; †California Institute of Technology, Pasadena, USA; and ††Riken Institute, Tokyo, Japan

Previous studies of HFO from intracranial microelectrodes and/or single neuron recordings consistently showed the frequencies at ictal onset above 100 Hz. 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 the lower range ictal frequencies should not be overlooked. Larger studies are underway.

Medical therapy and pharmacology

Early treatment with lacosamide: results of RELACOVA study

M. Garces*, E. Lopez Gomariz†, P. Giner‡, N. Torres§, E. Noe¶, J. Lopez-Trigo**, C. Santafe††, R. Munoz‡‡, M. Bonet§§, and V. Villanueva*. *Hospital Universitario y Politecnico La Fe, Valencia, Spain; †Hospital Luis Alcanyis, Xativa, Xativa, Spain; ‡Hospital Universsitario Dr. Peset, Valencia, Spain; §Hospital Dr. Peset, Valencia, Spain; ¶Hospital Valencia al MAr, Valencia, Spain; **Consorcio Hospital General Universitario Valencia, Valencia, Spain; ††Hospital Clinico Universitario Valencia, Valencia, Spain; ‡‡Hospital de La Ribera, Alzira, Spain; and §§Hospital Arnau de Vilanova, Valencia, Spain

Efficacy of Lacosamide (LCM) in partial epilepsy is high when used early and seems to be better when used with a non-sodium channel blocker.

Cognitive effects of lacosamide

D. Ijff, M. Majoie, and A. Aldenkamp. Kempenhaeghe, Heeze, Netherlands

Lacosamide has a positive effect on the information processing speed although patients complained more, especially about their cognitive function. Possible explanations for this discrepancy are the effect of reduction of co-medication and increased worries of patients during a trial, causing overestimation of cognitive effects.

Evaluation of sudden unexpected death in epilepsy (SUDEP) occurring in lamotrigine (LTG) clinical trials

T. Tomson*, L. Hirsch†, D. Friedman††, N. Bester§, A. Hammer¶, M. Irizarry¶, L. Ishihara§, A. Krishen¶, T. Spaulding¶, A. Wamil¶, and R. Leadbetter¶. *Karolinska Institute, Stockholm, Sweden; †Yale University, New Haven, CT, USA; ††New York University Langone Medical Center, New York, NY, USA; §GlaxoSmithKline, Uxbridge, UK; and ¶GlaxoSmithKline, Research Triangle Park, NC, USA

Although the rate of sudden unexpected death in epilepsy (SUDEP) was not statistically different between lamotrigine (LTG) and comparator groups, the confidence intervals were wide and a clinically important increased or decreased risk cannot be excluded.

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Meta-analysis of nonpsychotic behavioral treatment emergent adverse events in brivaracetam and levetiracetam development programs

J. D'Souza, M. Johnson†, and S. Borghs*. *UCB Pharma, Brussels, Belgium; and †UCB Pharma, Raleigh, USA*

Despite lacking statistical significance, the absolute and placebo-adjusted incidence of nonpsychotic behavioral treatment emergent adverse events were found to be numerically lower for brivaracetam compared with levetiracetam.

Efficacy of perampanel, a selective AMPA antagonist, in complex partial and secondarily generalized seizures: a pooled analysis of phase III studies in patients with treatment-resistant partial-onset seizures

B. J. Steinhoff, H. Gauffin†, P. Mckee††, D. Squillacote§, H. Yang§, D. Kumar§, and A. Laurenza§. *Epilepsiezentrum Kork, Kehl-Kork, Germany; †Linkoping University, Linkoping, Sweden; ††The James Cook University Hospital, Middlesbrough, UK; and §Eisai Neuroscience Product Creation Unit, Woodcliff Lake, NJ, USA*

In this sensitivity/subgroup analysis of phase III trials, perampanel decreased complex partial plus secondarily generalized seizures and secondarily generalized seizure frequency and increased responder rates, compared with placebo.

Long-term cognitive effects of treatment with monotherapy carbamazepine (CBZ) and valproate (VPA)

D. Ijff, M. Majoie, and A. Aldenkamp. Kempenhaeghe, Heeze, The Netherlands

The study shows evidence that at long-term carbamazepine (CBZ) may impact higher-order cognitive function and even intelligence in children. As this effect was not found for adults, this suggests that long-term treatment with CBZ may influence the maturation of the brain in children.

Mechanism of action of vagal nerve stimulation; evidence for acute anti-seizure affect

C. Mcgrane, F. Kazi, L. Flores, K. N. Ramesha, C. Quelly, M. P. Richardson, C. E. Polkey, and R. D. Elwes. Kings College Hospital, London, UK

In a selected group of patients with frequent electrical seizures vagal nerve stimulation on periods were associated with reduction in mean seizure duration in all cases, which was marked in 5 cases. Seizure frequency was not affected. The changes suggest that neural stimulation may acutely alter mechanisms of seizure spread or termination.

Semiology, etiology, and classification

Long-lasting epilepsy induces progressive changes in the brain: evidence from type II FCD patients

A. Finardi, F. Colciaghi*, C. Marras*, L. Castana†, P. Nobili*, M. Bramerio†, G. Lorusso†, and G. Battaglia*. *IRCCS Neurological Institute Carlo Besta, Milano, Italy; and †Niguarda General Hospital, Milano, Italy*

The morphometric data support the hypothesis that cellular abnormalities observed in type II focal cortical dysplasia (FCD) epileptic patients could be worsened by a long history of severe, repeated seizures and indicate that abnormalities of NMDA receptor complex and associated proteins are consistently associated with, and may sustain epileptogenesis of type II FCD patients.

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The clinical spectrum of hemimegalencephaly in children

F. X. Sanmarti*, M. I. Sigatullina†, J. Campistol*, and S. S. Shamansurov†. *Hospital San Joan De Deu, Barcelona, Spain; and †Tashkent Institute of Postgraduate Medical Education, Tashkent, Uzbekistan

In most cases, a clear correlation was found between the side of the hemimegalencephaly and seizure semiology, which were also confirmed by the continuous video-EEG register. Early intervention is important to prevent encephalopathy and compromise of function within the unaffected hemisphere.

Sensitivity of a 256 channel EEG recording in temporal mesial sclerosis patients and temporal neocortical patients

C. Arcaro, A. Del Felice, E. Formaggio, S. Storti, I. Boscolo Galazzo, R. Mai, A. Fiaschi, and P. Manganotti. Universita degli Studi di Verona, Verona, Italy

Since the basal temporal cortex is tangential to the lateral surface of the skull and neocortical epilepsy underlies a large field potential, anterior and posterior zygomatic electrodes respectively could be considered at the same time as a non-invasive method and specific tool to increase the maximum peak localization by visual inspection in patients affected by temporal mesial sclerosis and temporal neocortical epilepsy patients.

Women with epilepsy in perimenopause and menopause

G. Luef, A. Kullick, M. Prieschl, M. Bergmann, G. Walser, I. Unterberger, C. Brezinka, and L. Wild. Medical University Innsbruck, Innsbruck, Austria

Marked hormonal changes in the menopausal transition seem to have an effect on seizure susceptibility.

Impact of peri-ictal interventions on respiratory impairment and post-ictal generalized EEG attenuation

M. Seyal, and L. M. Bateman. University of California Davis, Sacramento, CA, USA

Nursing interventions occurred in seizures with post-ictal generalized EEG suppression (PGES) and more severe respiratory dysfunction (RD). Earlier intervention was associated with reduced duration of RD and PGES. These findings should be considered when developing measures to reduce sudden unexpected death in epilepsy (SUDEP) risk.

'Option grid' decision-support intervention for women taking sodium valproate and planning pregnancy

P. Smith, R. Seal, and G. J. Elwyn. University Hospital of Wales, Cardiff, UK

The option grid and evidence document should help women, with their clinicians, decide their best treatment option.

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Longterm outcome beyond 20 years in 66 patients with juvenile myoclonic epilepsy

P. Senf, B. Schmitz, M. Holtkamp, and D. Janz. Vivantes Humboldt Klinikum, Berlin, Germany

This study analyses the long term outcome of a well defined sample of patients with juvenile myoclonic epilepsy (JME). Seizure remission occurred in 60% of patients, 17.5% remained seizure free without antiepileptic drugs. Appearance of absence seizures was an attribute for a poor course with ongoing seizures without remission (p=0.009).

Electroclinical features in epilepsy caused by voltage gated potassium channel antibodies

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The spectrum of the electroclinical manifestations related to this entity may vary significantly and is not well defined yet. It is apparent that along with seizures a complex cognitive profile of disturbances is present. The EEG findings are mainly encephalopathetic, and MRI images show signal abnormalities in the limbic area. In contrast, the features in pediatric patients are more severe, in the context of status epilepticus and intractable seizures. Appropriate treatment results in varying degrees of clinical recovery.

The ketogenic diet in children with Dravet syndrome - The Austrian Experience

A. Dressler, M. Morzinger, E. Reithofer, P. Trimmel-Schwahofer, A. Muhlebner-Fahrngruber, G. Pahs, F. Benninger, R. Grassl, and M. Feucht. Medical University Vienna, Vienna, Austria

We observed a good initial response on the ketogenic diet (KD), but moderate long-term efficacy, probably due to the natural course of Dravet syndrome. In contrast, 2 patients remained free from seizures under Stiripentole. However, the KD prevented prolonged seizures and status epilepticus, and no side effects with a need to interrupt the diet in responders were observed.

Optimized individual treatment protocols in patients with Dravet-syndrome using electronic documentation with Epivista

R. Boor*, C. Dreiwes*, and U. Stephani†. *Northern German Epilepsy Centre, Schwentinental, Germany; and †University Medical Center Schleswig-Holstein, Kiel, Germany

Electronically augmented titration of anticonvulsant (ACD) provides good seizure outcome in Dravet-S. The combination of Stiripentol + Clobazame is helpful in pharmacoresistant Dravet-S.