

10th Asian & Oceanian Congress of Child Neurology: Expanding the Field of Child Neurology from the Region to the World

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On 10–13 June 2009, the 10th Asian and Oceanian Congress of Child Neurology took place in the Interburgo-Exco Hotel, Daegu, Korea. It is one of the oldest regional child neurology organizations in the world, which started 26 years ago in November 1983.

The conference was organized by the Korean Child Neurology Society and included 102 lectures, presented by well-known experts in the field from 28 countries, and also platform and poster sessions. There were many interesting sessions covering a variety of topics in the field child neurology, as well as instructive teaching seminars.

On the first day of the congress, 'Ketogenic Diet in Asian Countries' was introduced. The 'General Consensus' (J Helen Cross, UCL-Institute of Child Health, UK) and 'Future Direction' (Jong M Rho, St Joseph's Hospital, USA) were discussed, as well as 'How to Provide Ketogenic Diet in Asian Food Culture', which has useful practical applications. Moreover, various experiences in Asian countries including Korea, Iran, Taiwan and India were also presented. The presidential symposium on 'Genetic Implications in Childhood Neurological Disorders' took place on the second day; Ingrid Scheffer (University of Melbourne, Australia) presented 'Genetics of Epilepsy in Childhood: an Overview', focusing on the ion channel mutation. In the lecture on 'Mitochondrial Disorders: Diagnostic Challenge', David Thorburn (Mitochondrial & Metabolic Research, Australia) underlined that enzyme diagnosis using next-generation sequencing can be the starting point for investigation of the underlying molecular etiology. Ingrid Tein (University of Toronto, Canada) discussed the 'Approach to Neurometabolic Diseases in Children', which showed strategies according to symptoms and practical operational investigations. On the

third day, Michael V Johnston (Johns Hopkins University, MA, USA) spoke on major types of plasticity seen in children, which were adaptive plasticity, impaired plasticity and plasticity as the brain's 'Achilles' heel'. The updated research on epidemiology, genetics, early diagnosis and early intervention in autistic spectrum disorders were presented with beautiful slides by Virginia Wong (University of Hong Kong, China). In 'Cognitive Decline Associated with Epilepsy', Solomon Moshe (Albert Einstein College of Medicine, NY, USA) suggested that the developmental age when the epileptic disorder manifests may dictate outcome and be a deciding factor in selecting appropriate therapies.

Among all the lectures, the session of 'Epilepsy Surgery' was outstanding and noticeable. It discussed not only 'Epilepsy Surgery' itself, but also 'Advances in Neuroimaging', which can aid surgery. As we know, surgical treatment for some intractable seizures is inevitable and also challenging because both visualization and localization of the lesion are difficult. In this conference, many comprehensive and advanced studies using multimodal diagnostic tools were presented.

In the lecture given by Harry Chugani (Wayne State University, MI, USA), 'Multimodal Imaging Integration in Epileptic Network', he underlined that epileptic networks may undergo dynamic changes as a result of persistent seizures, thus recruiting more structures into the network. In children, expansion of an epileptic network may be related to the development of an epileptic encephalopathy and the

establishment of secondary epileptic foci that, if independent, must also be identified and resected in epilepsy surgery. However, we have no way of distinguishing between 'dependent' and 'independent' secondary epileptic foci so far. Therefore, advances in neuroimaging, such as PET, functional MRI and diffusion tensor imaging, have improved our understanding of the epilepsy networks and altered surgical approaches.

In the same session, Eishi Asano (Wayne State University, MI, USA) spoke on 'PET: Correlations Between the Cortical Glucose Metabolisms and High Frequency Oscillations in Pediatric Epilepsy' with 12 understandable cases. He presented that generally, hypometabolism on interictal PET was a good indicator of the dysfunctional cortex involving the seizure focus. But in some cases, seizure focus could be hypermetabolic and in others seizure focus could be normo-metabolic. That is, the mechanism of altered metabolic pattern could not be fully explained by the frequency of interictal epileptiform discharges alone. Thus, he hypothesized that fast-wave components (γ -oscillations >30 Hz) were related to hypermetabolism and slow-wave components (δ -oscillations 0.5–4.0 Hz) were related to hypometabolism. By means of the recently developed method to delineate the amplitudes of γ -oscillations on 3D-MRI, he presented two successful epilepsy surgery cases that suggested pathologic and physiologic γ was well correlated to hypermetabolism on PET.

Ki Hyeong Lee (Cincinnati Children's Hospital, OH, USA) presented 'Role of MEG (Magnetoencephalography) in Pediatric Epilepsy'. MEG is one of the relatively new non-invasive localization tools in epilepsy surgery. There are many advantages, such as noninvasiveness, precise spike source evaluation with high spatial resolution (millimeter order), functional data with high temporal resolution (millisecond order) and detection of EEG invisible epileptic current. It also has some shortcomings, such as giving only interictal information (false localization), time limitation and high economic cost. Since nonlesional cases in epilepsy surgery are up to 50% and multilesional cases are up to 50–60%, a single test is not sufficient for localization. MEG is invaluable for presurgical evaluation because it can show the eloquent area in cerebral cortex. It can be used as a powerful tool for both localization and functional mapping.

In a session devoted to 'Epileptic Surgery', three lectures were presented: update of epileptic surgery, epileptic surgery in nonlesional cases and that in multilesional cases.

Harry Chugani (Wayne State University, MI, USA) suggested that intractable epilepsy in infancy and young children should be considered because the epilepsy in this age group often results in an epileptic encephalopathy, particularly when the developmental lag is widening. In some cases early surgery may be indicated more for preservation of cognitive status rather than for the epilepsy itself. He indicated that the best surgical results are obtained when there is concordance between EEG and neuroimaging localization, and when the surrounding and contralateral brain regions are normal. Newer PET techniques can provide improved sensitivity for both seizure foci and extent of nociferous cortex.

Epileptic surgery in nonlesional cases was presented by Heung Dong Kim (Yonsei University, Korea). Surgical treatment became one of the important therapeutic tools in managing intractable epilepsy. However, epilepsy surgery in nonlesional cases is challenging owing to the difficulty in localizing seizure origin. Cases without discrete MRI lesion used to be considered as nonsurgical candidates. However, multimodal diagnostic studies including SPECT, PET and long-term EEG monitoring could provide information to localize the epileptogenic cortex. He described two successful epilepsy surgery cases with intractable epilepsy in nonlesional MRI findings in detail. One was frontal malformations of cortical development, which was found to give positive findings in MRS and diffusion tensor imaging. The other was a selective corpus callosotomy for lateralization, which was able to show epileptic focus in multimodal approaches such as PET, SPECT and long-term EEG monitoring. Furthermore, he reported the outcome of his experience with 29 cases of epilepsy surgery in MRI-negative lesions, which is one of the biggest numbers of epilepsy surgery in children. They showed positive findings in other modalities, such as ictal/interictal SPECT and PET with a concordance of 66–77%. Developmental progress is seen in most of cases after successful surgery with favorable seizure outcome, which showed the improvement in 79% (23 cases). He underlined again that surgical treatment should be more actively considered, even in cases of MRI-negative cases with medically refractory epilepsy children.

Yong D Park (Department of Pediatrics and Neurology, GA, USA) presented that patients with refractory multifocal/multileSIONAL epilepsy are not usually considered as surgical candidates. In such cases, targeted surgery may hold benefits for the patient when full control of seizures is not anticipated. Thus, in those cases, palliative surgeries, such as corpus callosotomy, brain stimulations (deep brain stimulation, responsive neurostimulation [RNS]) and vagus nerve stimulation) should be considered. Currently, a multicenter trial on stimulation of the anterior thalamic nucleus, the Stimulation of the Anterior Nucleus of the Thalamus for Epilepsy (SANTE) and RNS system trial is in progress in the USA. For the diversity of regions involved with seizure initiation and propagation, it has a variety of stimulation parameters including amplitude, frequency, pulse duration and continuous versus intermittent stimulation, which were apt to be controlled case by case. Preliminary results indicated that the RNS system might provide a safe and effective adjunctive treatment for adults with intractable partial-onset epilepsy with 50% or greater seizure reduction. A multicenter randomized double blinded trial is currently underway.

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