HIGHLIGHTS FROM INTERNATIONAL NEUROSCIENCE MEETINGS

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The 2009 28th International Epilepsy Congress was held in Budapest, Hungary, 28th June-2nd July 2009. The scientific presentations numbered over 350, of which 90 were from the platform and 836 were posters. In the following article, Dr. Raidah Al-Baradie summarizes the scientific highlights of these numerous presentations, each of which has a published abstract on the website: www.epilepsybudapest2009.org. We selected 2 plenary sessions of particular interest, to summarize.

Plenary sessions

Progressive functional and structural brain changes on serial manganese-enhanced MRI acquisition following traumatic brain injury in rat

Bouillert V, Cardamone L, Liu Y, Koe A, Myers D, O'Brien T

Head injury is the leading cause of death and morbidity. Nearly half of all head injuries result from motor vehicle accidents. Many remaining head injuries result from falls or child abuse. The incidence of head injury is 200 to 300 cases per year per 100,000 population. In the United States, around one million children each year sustain a head injury; of these, around 165,000 visit a hospital. Around one in 10 falls into the category of moderately to severe head injury. The most severe traumatic brain injuries (TBI) involve shearing injuries that disrupt the axons in the cerebral white matter. In this study, they used the idea that manganese-enhanced MRI (MEMRI) provides high contrast structural and functional detail of the brain in-vivo, which might help to assess the long-term morbidity. In this study, they utilized serial manganese enhanced MRI scanning in the fluid percussion injuries (FPI) rat's model to assess long-term changes in the brain following TBI. This study showed a progressive decrease in the brain volume, the cortex, the hippocampus, and an increase in the size of the ventricle at one and 6 months with progression over time. There were no differences in thalamic or amygdale volumes. It was concluded that progressive functional and structural changes might play a role in long-term adverse neurological outcome of head trauma such as epilepsy.

Childhood epilepsy…..and what about the child's sleep?

De Weerd A, Geerts Y

It is well known that sleep disturbances are common in adults with epilepsy. Some studies point out the presence of sleep problems, and adjustment, and behavioral problems in children with idiopathic epilepsy. The presence of epilepsy, although benign, in childhood is associated with adaptive problems of the child. From this point of view, the alteration of some sleep habits may be a sign of emotional maladjustment. Data on epilepsy and children's sleep, which is often abnormal, is not available. Although parents failed to perceive them as a problem, some findings indicate that attention to sleep and behavioral problems is important in clinical management of children with idiopathic epilepsy. The aim of this study is to provide more insight into the interaction between epilepsy and sleep during childhood. They found that patients and controls differed substantially (p<0.05-p<0.001): initiating and maintaining sleep was abnormal in 40% of patients and 15% of controls. For parasomnias and sleepiness during the day these figures were 32% in patients and 21% in controls for parasomnias, and 38% in patients and 18% in controls for sleepiness. They concluded that approximately twice as many sleep disturbances in children with epilepsy were seen when compared with controls. The most common problem was initiating and maintaining sleep, and parasomnia, and sleepiness during the day.

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Scientific presentations

Autonomic function and biorhythmicity

- Sudden unexpected death in epilepsy (SUDEP) is a tragic, but incompletely understood complication of intractable epilepsy. Even brief seizures can result in death, possibly by inducing a cardiac dysfunction and apnea.
- The novel gene KCNQ1 (KvLQT1) for epilepsy is the first to reveal the dual arrhythmogenic potential of an ion channelopathy co-expressed in the heart and brain. The LQT ion channels are expressed in the brain, suggesting a family candidate gene for SUDEP.
- Developing guidelines on when and how to counsel and educate patients, families, and medical professionals to learn about SUDEP in different formats for different populations.

Should we treat the family?

- A rehabilitation approach has been adopted for many long-term neurologic conditions, but not for epilepsy. The disabilities associated with epilepsy are cognitive, psychological, and social, which are not as readily identified by medical doctors as are physical disabilities. A rehabilitation approach moves the emphasis from a medically driven process to a focus on the personal, social, and physical context of long-term illness. It is suggested that a missed opportunity for education and support for self-management occurs after diagnosis. This results in disadvantage to those whose educational level and knowledge of epilepsy are low. People who do not achieve epilepsy control may then experience higher levels of psychological distress, and a negative cycle of loss of self-efficacy, poor epilepsy control, social disadvantage, and disability. Rehabilitation services have benefited communities surrounding centers of excellence. Not so in epilepsy. Despite centers of excellence, areas with deprivation have higher than national average levels of patients reporting a seizure in the prior year, and higher emergency hospital admissions. Specialists working in partnership with general practitioners (GPs) and practice nurses can do more to increase participation and reduce distress for people with epilepsy. When available, GPs and nurses with special interest in epilepsy promote integrated services. Primary-secondary networks are likely to be more effective in preventing downward drift.
- Developing an Epilepsy Foundation Career Support Center - www.epilepsyfoundation.org

Beyond the medical model

- Re-emphasis of the important role and progress with the (WHO) Global Campaign Against Epilepsy.
- Epilepsy has a significant impact on the psychosocial aspects, especially in social and labor areas, of people with this syndrome who also become stigmatized.
- Patients with epilepsy are more likely to experience homicides, suicides, and motor vehicle accidents.

Brain development, plasticity, and epilepsy

- Radial glia generate neurons directly and through intermediate precursor cells and there are distinct niches for symmetric and asymmetric neurogenesis.
- There are 4 distinct phases of radial neuronal migration.
- HGF/uPAR signaling promotes the migration and differentiation of cortical GABAergic interneurons and the parvalbumin GABAergic neurons are decreased selectively by almost 100%.
- Interneurons in frontal and parietal areas of the cortex are reduced by 50%.
- True protection is not feasible and salvaging may not be functional.
- Functional neurogenesis is yet to be proven.

The need for comprehensive care around the world

- Social integration of patients with epilepsy (PWE) is related to seizures (severity and frequency), independence in daily life, social skills, and neuropsychological function. There are gaps of understanding and recognition of QOL between PWE/families and physicians.
- Epilepsy was not properly understood even by medical/educational professionals.
- Early education and enlightenment on epilepsy is important.
- Social, living, and neuropsychological skills should be adequately rehabilitated.
- Measures should be taken to spread the benefit of the Global campaign against epilepsy across continents to include every country in the world.
- Each region should adopt the WHO measures in country assessments of epilepsy burden & healthcare performance. Efforts should be made to identify the data elements necessary for the measures.
- Effective collaboration of the developing and the developed world epilepsy centers (foster partnership).