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Editorial

Theranostic Management of Childhood Epilepsy

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Received: August 11, 2018; **Published:** September 07, 2018

Keywords: *Epilepsy; Theranostics; Personalized Medicine; Multidisciplinary Healthcare; Patient Education; Good Medical Practice*

Epilepsy is a relatively common and severe neurologic disorder in children. Indeed, childhood epilepsies are accompanied by debilitating neuropsychiatric and systemic co-morbidities and often present pharmacological resistant seizures. Its high prevalence, unpredictability, impact upon sufferers' development, their families and society, carry a grave risk of mortality.

Epileptic seizure is defined by [1] as "a transient occurrence of signs and/or symptoms due to abnormal excessive or synchronous neuronal activity in the brain". It can occur in a non-epileptic individual as a consequence of eclampsia, febrile convulsions, head injury, drugs and/or toxins.

During the last twenty years, advances in neuroimaging and neurogenetics have allowed to draw a clinical schema of epilepsy syndromes in children including wider taxonomy (focal onset, generalized onset, unknown onset) as well as a better understanding of their etiology (idiopathic, cryptogenic, symptomatic). Meantime, promising third-generation anti-epileptic drugs are emerging, important progress in the identification of antiepileptic compounds has been made, and specific pediatric trials are being performed to document their effect according to seizures and epilepsy syndromes as well as their tolerability [2].

Early and accurate diagnosis (including epileptic i.e. narcolepsy, paroxysmal dyskinesia or versus non-epileptic imitators i.e. psychogenic seizures) taking into account the child's complete history must contribute to a better therapeutic management, including for pharmacologically resistant patients (e.g. ketogenic diet, vagal nerve stimulation, surgery) and in case of medication failure to ensure optimal neurodevelopment [1,3,4].

Nowadays, thanks to the genome-wide analysis tools along with pharmacogenomics, there is a large research focus on genetic epilepsies and the mechanisms linking disease genes to epilepsy syndromes [5]. Moreover, efficient and safer antiepileptic drugs, which could be ideally accessible to countries with poor insurance coverage, are still dramatically lacking for the pediatric group. The need of a well-coordinated and experienced multidisciplinary team (e.g. neurologists, internists, radiologists, surgeons, nurses, pharmacologists, pharmacists, geneticists, family practice practitioners, biologists) appears essential for personalized medicine and so, to quickly decide the best theranostic approach/option (i.e. class of epilepsy, seizure type, etiology, best drug and dose to administrate in order to maintain the best risk/benefit ratio). Eventually, patient education remains a fundamental part of the management of these disorders.

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Volume 7 Issue 10 October 2018