Reduction in EEG Amplitude and Propagation of Neonatal Seizures after Phenobarbitone May Explain Electroclinical Dissociation

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Background: Electroclinical dissociation is the tendency for neonatal seizures to lose their clinical expression after the administration of routinely used antiepileptic drugs (AEDs) such as Phenobarbitone (Pb) but with persisting electrographic seizures (1, 2). It is not known if the characteristics of electrographic seizures are altered following AED administration, if so, this may help to explain the phenomenon of electroclinical dissociation.

Objective: The objective of this study was to compare the characteristics of electrographic seizures before and after Pb administration in neonates.

Methods: The EEGs of 18 term babies with seizures both pre and post Pb (262 seizures in each group) were studied. 10 features of seizures were quantified and summary measures for each baby were statistically compared pre and post Pb administration. Seizure features analysed included: peak amplitude, duration, the number of EEG channels involved at start and peak of seizure, frequency variation over the whole seizure, rhythmicity, background EEG, discharge morphology at start and peak and morphology change from start to peak. Differences between the two time periods (pre and post Pb) were investigated using the Wilcoxon Signed Rank test.

Results: Post Pb seizures were of significantly lower amplitude than pre Pb seizures, \(p=0.001\) [median pre Pb 123 µV (62.5-225) vs median post Pb 53.5µV (46.13-89.25)]. Post Pb seizures involved fewer EEG channels at the peak of seizure, \(p=0.018\) [median pre Pb 4 channels (3-8) vs median post Pb 3 channels (1.38-4)]. No other features showed a statistically significant difference.

Interpretation: These findings show that Pb reduces both the amplitude and propagation of seizures which may explain electroclinical dissociation. Electroclinical dissociation after Pb therapy can lead to false reassurance about the effectiveness of treatment. The true seizure burden is only revealed by continuous multi-channel EEG monitoring.

References


Unilateral Ventricular Dilation. Follow up During The First 2 Years of Life

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Objective: To investigate if the unilateral ventricular dilation detected by neonatal ultrasound is associated with neurological abnormalities in the first 2 years of life.

Material and methods: A number of 1319 neonates were examined by head ultrasound on day of life 1 and 3. Prenatal histories and ultrasound were collected in all the cases. There were selected the cases with unilateral ventricular dilation that were examined by head ultrasound at 1, 2, 4, 6 months and by clinical and neurologic examination and, if needed, specific imaging and neurologic investigations at 1, 2, 4, 6, 12 months and 2 years.

Results: There were detected the dilation of the left ventricle (18 cases); dilation of the posterior horn of the left ventricle (88 cases), dilation of the posterior horn of the right ventricle (12 cases). From the cases with ventricular dilation all were asymptomatic on the neonatal period and only 6/88 cases with left posterior horn dilation and 1/12 of the cases with right posterior horn dilation developed neurologic abnormalities. All these cases were identified before delivery by fetal ultrasound. The abnormalities identified were: tonus abnormalities – hypotonic at 4 and 6 months with normalization at 12 months in 3/88 cases with left posterior horn dilation and 1/12 of the cases with dilation of the posterior horn of the right ventricle. There were delays in the fine motor skills in all the 6 symptomatic cases with left ventricular dilation and 1/12 cases with right ventricular dilation.

Conclusions: Unilateral ventricular dilation detected by neonatal ultrasound is mainly asymptomatic. The symptomatic cases are characterized by transient tone abnormalities (hypotonia) and abnormalities in the fine motor skills.
ADEM in Children: A Heterogynous Entity

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Background: Acute disseminated encephalomyelitis is an immune-mediated inflammatory and demyelinating disorder of the central nervous system. Clinically, patients present with multifocal neurologic abnormalities reflecting the widespread involvement in central nervous system. With the widespread use of high-dose steroids, the long-term prognosis of ADEM with regard to functional and cognitive recovery is favorable.

Objectives: To describe clinical particularities of ADEM in children and to discuss the utility of corticosteroid therapy in this rare entity.

Patients and Methods: it is a retrospective study about 20 cases of ADEM in child collected in the paediatric department of Monastir hospital in Tunisia over a period of five years (2006-2012). The diagnosis of ADEM was confirmed by the cerebrospinal MRI in all cases and all patients were treated by high dose of intravenous corticosteroids (30 mg/kg/day).

Results: They were eight girls and twelve boys, aged between two and ten years. A peak of frequency was observed between 2 and 8 years (15 children). A prodromic phase preceding the neurological signs was present in fifteen cases (4-15days). The diagnosis of ADEM was suspected in front of the association of neurological abnormalities (coma, cerebellar dysfunction, pyramidal findings...) and general symptoms (fever, vomit, asthenia...). Results of cerebrospinal fluid analysis, EEG and cerebrospinal MRI were in favour of the diagnosis of ADEM. Intravenous immunoglobulins were used only in two cases after a partial response to corticosteroid therapy. Evolution was favorable in fifteen cases, one child had a relapse four months after the first episode, four children kept neuropsychological sequel and one patient was died further to a very shrill shape.

Conclusion: ADEM is a distinctive entity which is heterogynous, but different from other forms of post-infectious encephalitis. MRI is very useful for diagnosis, and high doses of intravenous corticosteroids are effective.
Measurement of Anxiety in Acutely and Chronically Ill Patients of Philippine Children’s Medical Center

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Background: A child’s life may be interned by illness and develop anxious anticipation of medical interventions which are perceived as pain and restrictions. Anxiety is a natural part of childhood. Research shows that untreated children with anxiety disorders are high risk to perform poorly in school, miss out important social experiences and engage in substance abuse, thus assessing the psychological aspect of health is necessary.

Objectives: To measure the anxiety in acutely and chronically ill patients of Philippine Children’s Medical Center.

Methodology: A cross sectional study which included 323 subjects 8-19 years old, acutely or chronically ill, seen either in Out Patient Department or admitted at PCMC and gave consent and assent for the study. State-Trait Anxiety Inventory for Children translated into Filipino was used to measure the anxiety of the subjects. Independent T-test was used to analyze and compare the participants’ anxiety level and characteristics.

Results: Average state anxiety between In patient was at p= 0.21 and out patients was at p=0.09. STAIC C1 t-tests indicated that there was no significant difference in the average state anxiety levels by gender, education and primary caregiver’s education.

Conclusion: Proneness and level of transitory anxiety between subjects were comparable. Perceived transitory anxiety according to gender and primary caregiver’s education were similar. Elementary graduate caregivers of acutely ill patients were more prone to anxiety. Acutely ill patients, whose primary caregivers were married mothers or widow/er had higher transitory anxiety.
Nutrition in Toddlers – Overfeeding Partly Resulting from Energy Rich Drinking

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Background and aims: Children's drinking often is stimulated by caregivers. Toddlers are frequently carrying their bottles with different colourful drinks. Its content is assumed to be energy rich as well. Basically children need water. As part of a nutritional observation drinking behaviour of toddlers (12-36 month) is analysed.

Methods: Austrian Mothers of mature born children (2500g BW) aged from 13-36 month were selected by chance in Austria and interviewed by students of nutritional pedagogic*. Beside personal data, a 3day-recall was performed. Energy intake was calculated by DGE-PC on basis of BLS data and consumption of drinks documented. Daily average intakes were compared with DACH references for age 1-4 years.

Results: In total 175 toddlers (80m, 95f) were selected for nutritional questionnaire. At time of investigation they were 23,85±16,02 months, a BMI of 16±2,26. With 5019kJ/d±1549kJ/d daily energy intake. Male showed an energy intake equivalent 112% and female 129% of body weight related DGE-Reference. BMI of only 57,1% (n=175) was within ±10% of Krohmeyer-Hauschild age and height related BMI-Reference, 16,6% were over -10% and 25,7% over +10% of BMI-Reference on their actual age. Per body weight the younger age group (12-24 mo) has drunken 189ml/kg d (male) and 237ml/kg d female, and the elder group (25-36 mo) drunk 193 ml/kg d (male) and 211 ml/kg d (female) in total. Only a total average of 21,4% volume of these amounts were water and tea. All the rest was energy containing drinks (juice, lemonade). Milk was calculated as food not as a drink. From all these drinks resulted an energy intake of 759 kJ/d representing an amount of 14,6%E of total daily energy intake.

Conclusion: Drinks in the eating behaviour are responsible for a high amount of energy. Need for the children is water only. The drinks mostly give energy and no nutrients. Children should be trained to drink water or tea even as obesity prevention.

* Collective work by students
Familiar Occurrence of Pyridoxin-dependent Epilepsy: A Case Report in Two Siblings

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Backround: In a case report authors draw attention to the pyridoxin-dependent epilepsy as a very rare cause of neonatal seizures. Molecular genetic examination of this disease is available to confirm the diagnosis.

Objectives: A case report of two siblings of healthy parents. The first boy died at the age of 18 month during a spell of seizures. His diagnoses were birth asphyxia, inborn pneumonia and hypoxic-ischemic encephalopathy grade II. Paroxysmal activity developed during newborn period and was unsuccessfully treated. The second boy was born after 16 years by Cesarian section at term and the postnatal adaptation was normal, Apgar score 10,10,10. He developed seizure activity at the age of 1 day [confirmed on EEG]. The administration of phenobarbital had no effect but pyridoxin administration stopped the paroxysmal activity immediately. The patient was discharged home after 2 weeks, his neurological state was normal. He is being treated continuously with pyridoxin and folic acid, his psychomotor development at the age of 2 years is normal.

Pyridoxin dependent epilepsy [PDE] was confirmed by molecular genetic examination. The parents are healthy vectors of 2 mutations in gene ALDH7A1, the infant is heterozygot for both mutations and the result is in causal connection with the diagnosis PDE.

The diagnosis of PDE can be suspected to be the cause of the pharmacoresistant epilepsy in the first brother.

Conclusion: The diagnosis of PDE should be considered in neonatal seizures without response to common antiepileptic drugs. The early diagnosis and therapy decreases the risk of irreversible damage of the brain. The treatment with pyridoxin should be permanent during the whole life, the correct dose is variable. Molecular genetic analysis is available from 2009 in the Czech republic.