Aims:

- 1) to quantify the tissue UCB content (TUCB) spontaneously present in five brain regions of Gunn rats; and
- 2) to unravel the dynamics of TUCB entry and clearance after sulphadimethoxine treatment .

Methods: Cortex (Cx), superior collicula (SC), inferior collicula (IC), cerebellum (CLL) and the rest of the brain (RB) were collected 1, 6, 24, 48 and 72 hrs after injection of sulfadimethoxine (200 mg/Kg; IP) in 17 days-old jj animals and in not treated JJ, Jj and jj rats. TUCB was analyzed by the HPLC based method (Zelenska_2008).

Results: In untreated jj animals TUCB brain amounts was about 80 times higher than in Jj and JJ, and no regional differences were detected. After sulphadimethoxine administration TUCB picked differently in the regions analyzed: 1 hr in Cx and SC, 6 hrs in RB, 24 hrs in IC, 6 - 24 hrs in CLL. 72 hrs after injection, TUCB content was lower than in not treated littermates.

Conclusions: The differential entry and clearance across brain areas show regional difference in cellular mechanisms modulating tissue UCB concentration. The different kinetics might be involved in the tissue resistance/sensitivity to bilirubin toxicity of nervous system.

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AMPLITUDE INTEGRATED EEG AS A DIAGNOSTIC TOOL IN NEONATAL STROKE

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Background: The two-channel amplitude integrated EEG (aEEG) allows for continuous monitoring of cortical activity of each hemisphere separately.

Aim: We present three newborns with unilateral cerebral infarction, in whom the aEEG was an important diagnostic tool.

Methods: Infants were monitored routinely by two-channel aEEG, electrodes were positioned in C3-P3, C4-P4.

Case reports:

Patient 1: Term newborn boy, birth weight 3620 g, Apgar scores 9/10/10. Admission on day 1 for apnea. The aEEG showed an abnormal background pattern with ictal activity on the left. Cerebral ultrasound exhibited a slight difference in echogenicity between left and right parieto-occipital parenchyma, MRI showed left arteria cerebri media infarction.

Patient 2: Term newborn girl, birth weight 2750g, Apgar scores 8/10/10, admitted day 3 for jerks of the left arm. The aEEG showed an abnormal background pattern bilaterally and ictal activity on the right. Haemorrhagic infarction in the right fronto-temporal region was suspected by ultrasound examination and subsequently confirmed by MRI.

Patient 3: Preterm boy (32 weeks), birth weight 2350g, Apgar scores 7/7/10, uncomplicated postnatal period, normal ultrasound findings in the first week of life. The aEEG in the second week showed left-sided ictal activity. Left arteria cerebri media infarction was diagnosed by ultrasound and MRI.

Summary:

In all three cases, unilateral ictal activity was displayed in the two-channel aEEG (difficult to recognize in one-channel aEEG). Clinical signs of cerebral infarction may be unspecific and ultrasound changes might be detected only when high suspicion is raised by the aEEG findings.

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FEATURES OF CONDUCT AND TREATMENT OF RESISTANT EPILEPTIC ATTACKS IN CHILDREN OF EARLY AGE WITH A TUBEROUS SCLEROSIS

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Aim: optimization of early diagnostics and treatment of resistant epileptic attacks in children with a tuberous sclerosis.

Methods: during the last 7 years there were studied 9 children with a tuberous sclerosis in an age category to 3 years. On the basis of magnetic resonance tomography, for all nine children there were determined hamartomas from 3 to

30 millimetres in the different areas of the brain. Intrauterinely, there were discovered rhabdomyomas in 3 children in a term 35-37 weeks of pregnancy. In spite of focal lesions of brain structures, in all children were noticed generalized tonic-clonic seizures (resistant) from 5 to 10 a day. During the treatment of Topamax (to 10 mg/kg), frequency of attacks decreased, however, there was no control. Apart from anticonvulsants (Topamax) the children started to receive the preparation Vigabatrin (from 40 to 100 mg/kg).

Results: combination of anticonvulsant therapy led to the decrease in the number of attacks in 4 children from 1 attack in a day to 1 attack in a month. In 5 children attacks were halted.

Conclusion: this work stresses the necessity of timely magnetic resonance tomography and combination of Topamax and Vigabatrin for optimization of treatment of resistant epileptic attacks in children with a tuberous sclerosis.

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CONGENITAL CENTRAL HYPOVENTILATION SYNDROME IN THREE INFANTS

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Background and aims: Congenital central hypoventilation syndrome (CCHS) is a rare syndrome characterized by the failure of automatic control of breathing with absent or negligible sensitivity to hypercapnia and hypoxaemia, primarily during sleep. It is associated with a number of conditions affecting or derived from the autonomic nervous system.

Methods: Three infants with CCHS were diagnosed in our tertiary pediatric hospital over five years.

Results: All three infants were born full term. During neonatal period they presented prolonged apneas and intermittent cyanosis, in the absence of cardiac, pulmonary or neuromuscular disease. They were treated by tracheostomy and mechanical ventilation. After initial respiratory dependency, they became able to sustain normal gas exchange during wakefulness. Two of three cases had Hirschsprung disease and mild generalized hypotonia. One experienced seizures unrelated to antecedent hypoxemia and cardiac arrhythmias. Dilated,

nonreactive pupils and lack of circadian temperature variation occurred in one. Cerebrovascular malformations, tumors of neural crest origin and pulmonary hypertension were not observed. Mutations of the PHOX2B gene were detected in all cases. At the age of 2 to 5 years, they are still under ventilatory support during sleep. The eldest child has been successfully decannulated and he is on NIV through a nasal mask. All three children are managed at home, with adequate growth, progress in achieving motor milestones and low morbidity.

Conclusions: Infants with CCHS represent a spectrum of severity. With early diagnosis and careful ventilatory management these children can engage in activities typical of children of their age.

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THE ROLE OF sICAM-1, sVCAM-1 ADHESION MOLECULES IN THE HIPOXYC-ISHEMIC ENCEPHALOPATHY OF NEWBORNS

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Background and aim: Soluble intracellular cell adhesion molecule-1 (sICAM-1) and soluble vessel cell adhesion molecule-1 (sVCAM-1) produced from endothelium by the influence of hypoxia, infection, immunocomplex ensures migration of leukocytes transendothelial to ischemic tissue.

The aim of our work is to determine the level of adhesion molecules (AM) in Central Nervous System (CNS) damages of risk group newborns, and its role in this process.

Methods: Umbilical cord blood and peripheral blood serum samples of newborns were collected for measuring the levels of sICAM-1, sVCAM-1. CNS damages were determined by neurosonography and dopplerographic examinations.

Newborns are divided into 3 groups in order to determine the degree of causal relationship between the level of AM and CNS damages. 1st group (main group) included 35 (43,75%) newborn infants with CNS hypoxic-ischemic damages, 2nd group (comparison group) 25 (31,25%) newborn infants entering risk group but not observed CNS damages, 3rd group (control group) 20 (25%) healthy newborn infants whose condition are sufficiently appreciated.