Summary

Monitoring of brain activity in critical sick newbornss

The aim of the study was evaluation of brain aktivity in neonates with perinatal asphyxia and correlation with short-term and long-term outcome. The second part of this work is focused on maturation of brain activity in preterm newborns.

We assessed traces in 88 neonates suffered from perinatal asphyxia (pH 6,96, BE -16,9) in the first part. aEEG traces were evaluated according classification by Hellström-Westas, short-term outcome was evaluated as development of hypoxic-ischemic encephalopathy (classification Sarnat-Sarnat). We divided children into 4 groups for assessment of long-term outcome – normal outcome, mild psychomotoric delay, severe psychomotoric retardation, death in perinatal period. We evaluated relation between aEEG, short-term and long-term outcome and biochemical markers of hypoxia (pH, BE, lactate) and Apgar score. We reached SE 77 %, SP 100 %, PPV 100 %, NPV 74 % in assessment of correlation between aEEG and short-term outcome, SE 92 %, SP 81 %, PPV 74 % a NPV 94 % in relation between aEEG and long-term outcome and SE 100 %, SP 66 %., PPV 64 %., NPV 100 % in correlation between HIE and long-term outcome. There was gained statistically significant dependence between aEEG and umbilical pH, between lactate and aEEG, short-term and long-term outcome and between Agar score in 5^{th} and 10^{th} minute and outcome. The indication of therapeutic hypothermia was evaluated retrospectivelly. The children without indication had normal outcome in 83 %, severe retardation of outcome was in 27 % and death in perinatal period was in 43 % of children with indication of hypothermia. We use whole body hypotermia now and we indicated 11 neonates to this treatment and 45 % developed HIE grade II and 55 % HIE grade III.

The second part was interested in maturation of brain activity in healthy preterm neonates born before 30^{th} week of gestation. We assed 83 traces in 15 newborns. There was significant dependence between gestational age and scoring system according Burdjalov, percentage of continuous activity and lenght of continuous parts of trace.

The relation between aEEG trace and oucome was proved. We showed that Apgar score is still valuable prognostic marker of hypoxia. The first data of assessment of brain activity in preterm newborns were obtaind for use in next studies.