not the neonatal scan, we speculate that NS may have a negative effect on hippocampal development. However, these results could also be explained by unmeasured neonatal hypoxic-ischemic injury. The findings are in keeping with studies that suggest NS are an independent risk factor for adverse neurodevelopmental outcome. Further studies are needed to confirm whether seizures harm newborns.

Acknowledgements NIH/NCRR (UL1 RR024131); NIH/NINDS P50NS053902.

Abstracts

Background Further to investigate whether increased S100 levels in serum are correlated with the grade of HIE after perinatal asphyxia, mechanical ventilation in some severe cases of the asphyxiated infants and more specifically increased S100 in preterm newborns, we measured the concentration of S100, a protein that is released when cells are stressed or injured. The objective was to evaluate the concentration of S100 in newborns with or without brain injury.

Methods S100 levels were measured on postnatal days 1–3–7 in 62 term infants with birth asphyxia. S100B levels were measured using ECLIA method.

Results The average serum S100 levels for the control group (N=48) was 0.12 microgL−1 (cut-off point). S100B levels were significantly higher in asphyxiated term neonates N=29; M=0.64. Infants with moderate and severe HIE had significantly higher S100 levels on postnatal day 1 (p=0.031) and day 2 (p=0.005) than infants with mild or no HIE. The levels of S100 decreased on days 2 and 3 in all infants with HIE. The median S100 level on postnatal day 1 was higher in eight infants who died neonatally and in 10 infants who developed cerebral palsy (CP), compared with 43 infants with no signs of impairment at follow up.

Conclusion Early determination of serum S100 may reflect the extent of brain damage in infants with HIE after asphyxia.

Background and Aims Two studies on high frequency oscillatory ventilation (HFOV) have demonstrated a high relation between this method and the incidence of hemorrhagic or ischemic brain injuries. In this study, we meant to verify the incidence of intraventricular hemorrhage (III–IV) and cystic periventricular leukomalacia (CPVL) in subjects submitted to different ventilation (HFOV vs CMV).

Materials and Methods We have examined 120 newborns (mean gestational age 36±1.85 weeks, mean birth weight 3143±404.14 grams). Group A: 60 infants ventilated in HFOV; Group B: 60 infants ventilated in CMV. All received surfactant. All infants underwent monitoring of cardiovascular function with evaluation of parameters such as fractional shortening, ejec- tion fraction, size of rooms, the ductal shunt, pulmonary artery pressure and cardiac output and blood pressure.

Results Infants ventilated in HFOV have required a maximum value of MAP significantly lower (p<0.05) versus those ventilated in CMV, in group A, 8 (13.3%) experienced a hemorrhage of III–IV degree against 12 (20%) of subjects in group B.

They presented CPVL 14 (7.23%) infants in group A compared with 16 (26.6%) in group B. There were no differences in cerebral blood flow and resistance index of the anterior cerebral artery. There were no differences in cardiac function.

Conclusions Our data show an increase, not statistically significant, of PVH and CPVL in newborn infants treated with conventional ventilation than oscillatory ventilation. This is attributable to the use of a MAP “optimal” able to obtain a good alveolar recruitment without causing hyperexpansion.

Background and Aims Evoked potentials are a useful non-invasive method for the assessment of neurological status in term and preterm infants at risk for perinatal CNS damage. The present study intended to gather reference values of visual evoked potentials (VEP) for preterm and term neonates and identify neonates at risk for perinatal CNS lesions using VEPs.

Methods 23 healthy preterm and term neonates (group A) and 16 infants with perinatal brain injury (group B) were examined for this study. Groups were classified according to their post-conceptual age (A1/B1: 42–45 weeks, n=4/6; A2/B2: 38–41 weeks, n=5/8; A3: 36–37 weeks, n=12; A4/B4: < 36 weeks, n=2/2). Stimulation was triggered by stroboscopic flashes (1 Hz/10 µs) and P1 and N2 waves were analyzed.

Results Latencies significantly correlated with post-conceptual age (P1: p<0.001, N2: p<0.05) and gestational age (P1: p<0.01). The average latency values (mean±SD) of the subgroups were: group A1 (P1:165.7±33.5, N2:211.5±29.9), A2 (P1: 199.6±34.2; N2:255.6±29.8), A3 (P1:223.8±14.7, N2:272.1±13.5), A4 (P1:240 resp. 209ms; N2:242 resp. 233ms). Average latencies of term infants with or without perinatal injury differed significantly for P1 (228.8±30.9 vs. 165.7±33.5; p<0.05) and N2 (266.0±32.1 vs. 211.5±29.9; p<0.01).

Conclusions The present study adds to the knowledge on normal VEP values during early development. Present data showed a negative correlation with post-conceptual age for central latencies as an equivalent of progressing myelination regardless of extra- or intrauterine maturatation. Term infants with perinatal brain injury showed significantly prolonged VEP latencies compared to healthy children.

Background and Aims Studies have shown that newborns with low birth weight and gestational age are at higher risk for the pathogenesis of cerebral palsy (CP). Infants with CP have a significantly lower severity score of multiple organ system dysfunction (MODS). We hypothesized that newborns with higher MODS are at higher risk for the development of cerebral palsy (CP) compared to those with lower MODS.

Materials and Methods We determined the severity of MODS in 100 newborns (mean gestational age 36±1.85 weeks, mean birth weight 3143±404.14 grams). MODS was calculated using the modified MODS score devised by the American Society for Artificial Internal Organs. The score ranges from 0 (no MODS) to 5 (maximal MODS).

Results The severity score of MODS was significantly higher in newborns with CP (mean MODS 2.5±1.3) compared to newborns without CP (mean MODS 1.3±0.8). Also, the incidence of CP was significantly higher in newborns with a MODS score >2 (20% vs. 5%).

Conclusions The present study suggests that MODS score is a useful tool in the prediction of cerebral palsy (CP) in newborns. Newborns with a MODS score >2 have a significantly higher risk of developing cerebral palsy (CP).