17 ELEVATED LEVEL OF HYPOXANTHINE (HX) IN VITREOUS HUMOR (VH) IN NEWBORN PIGLETS WITH EXPERIMENTAL PNEUMOTHORAX (EPT)

P.Temesvári, Cs.Ábrahám, J.Kovács, Zs.Baranyai
Pediatric Clinics, Univ.Med.,Szeged and Pécs, Hungary

HX levels in VH from piglets (n=30) were determined using HPLC. Ten animals served as controls (Group 1), the others were studied in the course of EPT (Group 2, n=10, Group 3, n=10; EPT model see in Neurosci.Letters 93:38,1988.). In Group 2 VH was sampled at the critical stage of EPT (58.6±5.9 min. after the start of the experiment, arterial pH 6.94±0.02, st.bic. 12.0±0.7mM/l, pCO_2 78.7 ±7.1 mmHg, pO_2 24.0±2.3 mmHg, MABP 19.1±1.2 mmHg) and HX levels were significantly higher (191.9±45.2 µM/l) than in Group 1 (77.5 ±13.7 µM/l, $p < 0.05$). In Group 3 the animals were resuscitated at the critical stage (60.1±3.9 min. after the start of the experiment, arterial pH 6.99±0.04, st.bic. 11.0±0.9 mM/l, pCO_2 70.8±8.3 mmHg, pO_2 26.7±2.7 mmHg, MABP 17.8±0.5 mmHg) and VH was sampled 3 hours later during the posthypoxic-reoxygenation period (arterial pH 7.22±0.05, st.bic. 16.7±2.2 mM/l, pCO_2 39.2±2.7 mmHg, pO_2 47.9±4.4 mmHg, MABP 49.1±5.4 mmHg), when VH HX levels decreased (135.9±33.1 µM/l, N.S. vs. Group 1 and 2). It is concluded that EPT in newborns is accompanied with a transient increase of HX in VH.
(all values are $\bar{X}$, ± SE)

18 **The effect of endotracheal suctioning on the cerebral oxygenation of newborn infants.**

O. Pryds, L. Skov, J. Ryding
Department of Neonatology, Rigshospitalet, Copenhagen, Denmark.

Endotracheal suctioning of mechanically ventilated, newborn infants is accompanied with slight hypoxia and changes in arterial blood pressure. These events may have adverse effects on the cerebral haemodynamics of the sick neonate. 30 newborn infants were investigated twice during endotracheal suctioning which was performed with and without preoxygenation (GA 25-41 weeks). Brain oxygenation was estimated by near infrared spectroscopy, and mean arterial blood pressure (MABP), arterial blood gases (PO_2 and PCO_2) and arterial blood oxygen saturation (S_aO_2) were recorded simultaneously.
In the brain, oxygenated hemoglobin and oxidized cytochrome aa3 decreased slightly during the procedures, as expected ($P<0.05$). The changes of total cerebral blood content (CBVI) were closely related to the concomitant changes of PCO_2 ($P<0.0001$), whereas there was no relation between changes of CBVI and changes of PO_2, S_aO_2 or MABP, respectively. A 10 min period of preoxygenation did not ameliorate the physiologic responses.
The findings were independent of the gestational age and indicate an intact cerebral autoregulation of the newborn infant.

19 **The relation between VEP parameters and brain oxygen delivery of preterm infants.**

O.Pryds, G. Greisen.
Department of Neonatology, Rigshospitalet, Copenhagen, Denmark.

In preterm infants the visual evoked potential (VEP) is attenuated at P_aO_2 levels below 2.5 to 3.0 kPa. However, progressive VEP attenuation in terms of delayed latency and decreased amplitude is also observed at higher stimulation frequency ($P<0.005$). The degree of VEP attenuation may indicate low substrate delivery to the visual tracts.
26 preterm infants (GA 25-34 weeks) were investigated daily during the first three days of life. Single flash VEPs were recorded at different stimulation intervals (2, 4 and 30 sec) and oxygen delivery to the brain (OD) was calculated from the product of cerebral blood flow and the arterial oxygen content. In all infants a VEP was present. The VEP parameters and the degree of attenuation was neither related to OD (1.2 to 6.2 ml/100g/min) nor to perinatal data and postnatal age. Furthermore, there was no difference between infants who survived and those who developed cerebral lesions or died.
The results indicate that the neurons generating the VEP are supported sufficiently at very low levels of OD. VEP attenuation in preterm infants cannot be interpreted as imminent ischemia.

20 **Aminophylline reduces CBF of preterm infants without affecting the VEP.**

O.Pryds, S. Schneider.
Department of Neonatology, Rigshospitalet, Copenhagen, Denmark. Department of Neurology, Loma Linda, USA.

The effect of aminophylline (10 mg/kg) was investigated in 16 preterm infants (25 to 34 weeks of gestational age). The infants were weaned from mechanical ventilation and all had normal brain ultrasonograms. Cerebral blood flow (CBF), mean arterial blood pressure (MABP), arterial blood gases (P_aO_2 and P_aCO_2) and visual evoked potentials (VEP) were recorded just before, immediately after and 1 hour after aminophylline was given intravenously.
A VEP was present in all infants. Between the three measurements, there were no significant changes in CBF, MABP, P_aO_2, P_aCO_2 or VEP parameters (ANOVA). However, the intra-individual changes in CBF were positively related to the minor variations of P_aCO_2 (CBF changed 33.2% per kPa; $P<0.0001$). After having accounted for changes in P_aCO_2, CBF had decreased 5.5% (95% CI -1.7 to 12.2) just after aminophylline, and decreased 13.8% (95% CI 7.3 to 19.9) one hour after aminophylline.
It is concluded that aminophylline has a direct effect on CBF but apparently without affecting the cerebral function of stable, preterm infants.

21 **Effect of Soy-Protein versus Classical Type-II Diet on Lipoproteins in Children with Familial Hypercholesterolemia**

K.Widhalm, R.Pakosta, G.Leitner
Dept.of Pediatrics, Univ.Vienna,Austria

Heterozygous Familial Hypercholesterolemia (FH) is inherited as an autosomal dominant trait, characterized by significant elevation of low density lipoprotein (LDL) and total cholesterol (TC).In our study we investigated the effect of classical Type-II diet compared with soy-protein diet in6 children (3 boys,3 girls) affected with FH.The study was designed in 3 sections of 8 weeks each. During the first 8 weeks the subjects were treated with the Type-II diet, after a break of 2 months the patients were switched over to the soy-protein diet.Fasting blood was taken after 2,4, 6 and 8 weeks of each dietary period. A cholesterol lowering effect by means of the Type-II diet could be achieved by 11,8% (from 224 to 198mg/dl).During the soy-protein diet a significantly more pronounced reduction could be observed (TC: -21%, from 235 to 186mg/dl, $p<0.01$; LDL-C -28,2%, from 184 to 132 mg/dl, $p<0.01$) and of ApoB (-26,7% from 116 to 85mg/dl, $p<0.05$). On the other hand HDL-C decreased by 11,3% (from 54 to 47mg/dl, p=n.s.). Aminoacid determination showed that during classical Type-II diet only His decreased, however, during soy-protein substituted diet, Tau,Ser,Val, Cys,Met and Arg decreased significantly ($p<0.05$). It can be concluded, that soy protein diet presents an important contribution to the measures by which TC and LDL-Chol can be markedly lowered in children affected with FH.

22 **RENAL BLOOD FLOW VELOCITY IN PRETERM INFANTS WITH SEVERE RESPIRATORY DISTRESS SYNDROME.**

Margot van de Bor, Frank van Bel, Gerard L. Guit, Jaap Schipper. Leiden University Hospital, Departments of Pediatrics and Radiology, Leiden, The Netherlands.

Diuresis is impaired in preterm infants with severe respiratory distress syndrome (RDS). We measured renal blood flow velocity (RBFV) in the right renal artery (RRA) in 42 ventilated preterm infants <32 wks gestation: 32 with severe RDS and 10 without RDS. RBFV and cardiac output were determined with 2D/pulsed Doppler ultrasound between 24-36 h after birth. Mean arterial blood pressure and heart rate were recorded simultaneously from an indwelling umbilical artery line. Prior to the ultrasound measurements arterial blood gases, hematocrit, and mean airway pressure (MAP) were determined. Peak systolic, end diastolic, and mean flow velocities in the RRA were calculated. Infants with severe RDS had a significantly lower mean flow velocity in the RRA than the controls (19.9 ± 0.4 [mean ± SD] vs 23.2 ± 0.9 cm/sec; $p<0.002$). Stepwise regression analysis showed that this reduction in RBFV was primarily determined by a higher MAP and lower cardiac output. We speculate that a high MAP in infants with severe RDS increases intrathoracic pressure, leading to a reduced venous return and lower cardiac output and blood pressure. This may explain our finding of a reduced mean blood flow velocity in the right renal artery in preterm infants with severe RDS.