13 VISUAL AND AUDITORY EVOKED POTENTIALS IN ADOLESCENTS WITH HYPERPHENYLALANINEMIA

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Evoked potential testing was done in 34 adolescent patients with hyperphenylalaninemia (21 type 1, 8 type 2, 4 type 3, 1 DHPR deficiency) and in 35 control persons. In all but 4 of the type 1 and 2 patients the dietary treatment had been started during the first 12 weeks of life. In 22 the diet had been terminated at the age of 10.1 + 1.6 years (range 6 - 13 years). 8 patients were still on diet at the time of this investigation.
In the pattern reversal VEP a prolongation of the latency of wave P100 was found (104.3 $\pm$ 6.2 ms vs. 99.3 $\pm$ 3.4 ms, $p < 0.001$). This prolongation correlated significantly with the quality of diet during the first 10 years of life. Controling for the quality of diet no influence of the age at which the diet was terminated was demonstrated. There were no correlations between the VEP findings and the Phe concentration at later ages.
Click-evoked BAEPs were normal with regard to the latency and shape of waves I through V. The only difference between patients and control persons was an increase of the interear difference of the interwave lateny I-V.

14 MUTUAL CORRECTION OF ^{14}C-GALACTOSE MACROMOLECULAR INCORPORATION AND SECRETION BY GALACTOKINASE (GK$^-$) AND GALACTOSE-1-PHOSPHATE URIDYLTRANSFERASE (UDPT$^-$) DEFICIENT FIBROBLASTS IN CULTURE

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^{14}C-galactose (^{14}C-Gal) or ^{14}C-galactosamine (^{14}C-GalN) and ^{14}C-N-acetylgalactosamine (^{14}C-NAcGalN) when added to culture medium were incorporated into cellular and into secreted extracellular macromolecules by normal human fibroblasts. GK$^-$ fibroblasts incorporated less than 5% of both ^{14}C-Gal and ^{14}C-GalN into cellular and less than 10% into extracellular macromolecules, while UDPT$^-$ fibroblasts incorporated about 25% into cellular and 10% into extracellular macromolecules. ^{14}C-NAcGalN was incorporated by GK$^-$ and UDPT$^-$ cells similarly to normal. Fibroblasts from the two genetic enzyme deficencies, when cocultured to equal parts at high density, mutually compensated the macromolecular ^{14}C-Gal incorporation. GK$^-$ cells incorporated ^{14}C-galactose-1-phosphate (^{14}C-Gal-1-P) or UDP-^{14}C-galactose (UDP-^{14}C-Gal) similarly to control fibroblasts. UDPT$^-$ cells incorporated ^{14}C-Gal-1-P only to 10% compared to control fibroblasts, while UDP-^{14}C-Gal was incorporated normally.
Conclusion: 1. GalN and Gal but not NAcGalN are incorporated into macromolecules by the same enzymes. 2. Restoration of Gal and GalN incorporation by coculture of UDPT$^-$ and GK$^-$ cells, may be explained by mutual exchange of Gal-1-P or GalN-1-P and their nucleotides by cell cell interaction.

15 DIFFERENTIALLY IMPAIRED OXIDATION OF BRANCHED-CHAIN AMINO ACIDS IN MAPLE SYRUP URINE DISEASE (MSUD) FIBROBLASTS

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Whether the impaired branched-chain 2-oxo acid dehydrogenase (BCOA-DH) activity in MSUD is concurrently or rather differentially reduced against the different 2-oxo acid substrates was assessed by measuring the $^{14}CO_2$ release in 90-min incubations of cultured human skin fibroblasts with 1-^{14}C-labeled branched-chain L-amino acids (BCAA) at 1 mmol/l.

In controls (5 strains), $^{14}CO_2$ was in the order val > ile $\geqslant$ leu > allo-ile and amounted to about 8, 6, 5, and 2 nmol/90 min per mg of cell protein. In the MSUD cell lines JA, TE, MO (variants), JK, and NO (classical), residual BCOA-DH activity (as compared to $^{14}CO_2$ release in controls = 100%) with val, ile, leu, and allo-ile amounted to about 6, 10, 7, and 30%, to 7, 8, 9, and 35%, to 2, 2, 4, and 9%, to 2, 3, 4, and 20% and to 2, 4, 3, and 37%, respectively. These differences could not be attributed to different BCAA transamination rates.

Apparently, BCOA-DH activity in MSUD cells was differentially impaired against the different substrates tested, though to a varying extent. The observed differences might contribute to the clinical and clinical-chemical heterogeneity in MSUD.

16 EFFECTS OF PARTIAL PLASMA EXCHANGE TRANSFUSION (PPET) ON CEREBRAL BLOOD FLOW VELOCITY (CBFV) IN POLYCYTHAEMIC NEWBORN INFANTS.

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In 37 newborn infants with polycythaemia (with or without clinical symptoms) we performed a PPET. CBFV was measured before, 3, 12 and 24 hours after PPET. In a matched control group (N=15) CBFV was measured 6, 12, and 24 hours after birth. CBFV was recorded with a bidirectional 5 mHz continuous wave velocimeter. Recordings were made from the anterior cerebral and left mid cerebral arteries. The study group included 14 term infants, 11 preterm infants and 12 small for date infants. The peripheral venous Hct decreased from 72.5$\pm$2.7% ($\bar{x} \pm$ SD) to 60.1 $\pm$ 4.2% after PPET. Heart rate and blood pressure did not change significantly. Peak systolic flow velocity (PSFV), peak diastolic flow velocity (PDFV) and mean flow (AUTC) increased significantly ($P < 0.001$) at 3 hours after PPET. The PI (PSFV-PDFV/PSFV) did not change significantly ($0.1 < P < 0.5$). CBFV obtained after PPET did not differ from CBFV in the control group and this remained constant at 12 and 24 hours thereafter. When analysing the changes in CBFV after PPET we observed comparable changes of flow parameters in the 3 subgroups of infants within the study group. We concluded that lowering the Hct by PPET in polycythaemic newborn infants normalises the CBFV after 3 hours and this remains constant up to 24 hours. This could help to clarify indications to PPET in polycythaemic newborns.

17 CEREBRAL VASODILATATION RESPONSE TO ACETAZOLAMIDE IN THE HEALTHY NEWBORN PIGLET

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This study investigates the effect of azetazolamide on cerebral blood flow, blood pressure, and CO2 elimination.

9 newborn piglets were studied. They were anaesthetised ventilated, paralysed, and arterial and venous catheters were inserted. A fontanelle was surgically created and cerebral blood velocity (CBV) in an intracranial artery measured with a 5 MHz computerised Doppler (Vingmed SD 100) system held on the fontanelle.

50 mg/kg acetazolamide IV produced a large increase in CBV (median 70%, range 38-100%) with no change in arterial pressure. Within 1 minute of administration of acetazolamide, end-expiratory CO2 started to fall (median fall 45%) and arterial pCO2 started to rise (median rise 1.3 kPa), despite controlled ventilation being unchanged. The vasodilatation response to acetazolamide was lost if the cerebral circulation was already dilated by a high pCO2.

It seems likely that acetazolamide inhibits the transfer of CO2 from brain tissue to bicarbonate within cerebral blood vessels and so allows local build-up of CO2 around the cerebral vessels smooth muscle, thus producing cerebral vasodilatation.

18 ACUTE EFFECTS OF ACETAZOLAMIDE IN THE NEWBORN INFANT

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Acetazolamide is being increasingly used for the treatment of post-haemorrhagic ventricular dilatation. The aims of this study were to determine what effects acetazolamde had on cerebral blood flow, intra cranial pressure, and respiration in newborn infants

7 infants were studied. 6 had post-haemorrhagic ventricular dilatation and one had external hydrocephalus. They received their first dose of acetazolamide 50 mg/kg IV at a postnatal age ranging from 2 to 17 weeks. Measurements of mean average cerebral blood velocity (CBV) were made from the middle cerebral artery using the duplex Doppler Vingmed CFM 700 system. Intracranial pressure was measured invasively in 5 infants and with a fontanometer in 2.

CBV increased in all cases by a median of 86% Maximum increase was reached within 2-15 minutes after slow IV injection. The duration of the effect varied from 30 minutes to more than 3.5 hours. Intracranial pressure increased in 5 infants by a median of 7 mm Hg and was unchanged in 2. PCO2 rose by median of 0.2 kPa (range 0.2 to 0.6 kPa) and then fell as the respiratory rate increased by approximately 10 breaths/minute.