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 EVOKED EEG RESPONSES IN SGA NEWBORN INFANTS
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Fetal growth retardation is an important perinatal riskfactor. We try to use evoked EEG responses (ER) for evaluation of cerebral function in this riskgroup.

MATERIAL AND METHOD: 50 SGA newborns were examined. Visual (VER) and somatosensory (SER) cortical ER as well as auditory brainstem responses (BSER) were recorded and computer averaged.

RESULTS: In 70% of the SGA newborns some immature features of VER were observed - inadequate response patterns, increased exhaustibility and/or prolonged latency. The same differenties were found in SGA twins in pairs where the other sibling was AGA. SER showed similar changes only in 25% of cases. BSER were altered only exceptionally.

CONCLUSION: There is no direct relation between birthweight and brain development which is generally dependent on gestational age. Nevertheless in many SGA newborns are cerebral functions less mature and more vulnerable than in AGA infants.

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Consecutive injection of L-alanine and fat emulsion in 4-hour-old small-for-gestational-age (SGA) infants. Effects on plasma concentrations of lipid and carbohydrate metabolites.

In earlier studies we showed that injection of fat emulsion (Intralipid®) corrected the hypoglycemia of 4-hour-old SGA-infants concomitantly with increasing levels of B-OH-butyrate and falling RQ indicating fatty acid oxidation. Other investigators found that hypoglycemic SGA-infants did not raise their blood glucose in response to an intravenous L-alanine load whereas normoglycemic SGA-infants did. In the present study 7 SGA neonates with (N=3) and without (N=4) hypoglycemia (<1.65 mmol/l) at 4 hours of age were given L-alanine (150 mg/kg) and 60 minutes later Intralipid® (0.5 g fat/kg). Plasma concentrations of lipid and carbohydrate metabolites were measured up to 4 hours after fat injection. Blood glucose did not change after L-alanine in the hypoglycemic infants but decreased in the normoglycemic babies, 2 of them becoming hypoglycemic. All 7 infants increased their blood glucose in response to fat administration. Following L-alanine injection there was also a fall in B-OH-butyrate levels simultaneously with decreasing or constantly low blood glucose. This potentially harmful situation was rapidly reversed with fat injection. In conclusion administration of alanine is of no benefit in hypoglycemic SGA-infants and could possibly even be harmful in both hypo- and normoglycemic SGA babies through its antiketogenic effect.

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Evaporation from the skin and heat exchange with the environment in pre-term and full-term infants.

In newborn infants insensible water loss affects both water and heat balance. Studies on evaporative water loss have been made by measuring the evaporation rate from the skin surface and the transepidermal water loss (TEWL; g/m²h) has been estimated. Heat loss has been calculated from the found values for TEWL and from measurements of the temperatures of the skin, the ambient air and the surrounding surfaces. Body temperature was kept between 36.0-37.0°C by regulating the ambient temperature in the incubator. The relative humidity was kept at 50 %. On the first day of postnatal life pre-term infants have a much higher TEWL than full-term infants. There is an exponential relationship between gestational age and TEWL. The heat loss by evaporation from the skin is the dominating form of heat loss for infants with a gestational age shorter than 29 completed weeks. The heat loss through radiation is moderate in this group of infants but is the most important mode of heat loss in infants born after a longer gestation. The heat loss through radiation is thus about 5 times higher than the evaporative heat loss in full-term infants. The heat exchange through convection between the infant and the environment leads to a gain of heat in infants born after a short gestation and a loss almost equal to that of evaporation in moderately pre-term and full-term infants.

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Relationship between Energy Expenditure (EE) and Weight Gain (WG) in very low birthweight infants (VLB) during the first weeks of life. The time course of EE was studied using an indirect calorimeter which fits into an incubator and allows around the clock measurements. In 9 VLB (1134±370g; 29±3 weeks; appropriate for gest. age) V02 and VCO2 were continuously measured by a mass spectrometer. From these data and urinary nitrogen excretion EE was computed. In order to assess the energetic cost of growth, EE was correlated to the rate of WG and partitioned between growth and nongrowth functions:

Age (days)	Intake (kJ/kg·day)	EE ± SEM (W/kg)	WG ± SEM (g/kg·day)	% of EE covering WG
1 - 7	260	2.15 ± 0.1	-15.1 ± 4.1	-
8 - 14	450	2.5 ± 0.3	+11.5 ± 2.3	14%
15 - 21	500	3.0 ± 0.3	+14.8 ± 2.6	28%

The following characteristics of energy metabolism in the growing VLB nursed with actual techniques (thermoneutrality, glucose infusion early feeding) are suggested by these results:

The rate of WG is closely related to EE.

The VLB is able to invest a large part of EE to cover the metabolic cost of WG.

The metabolic efficiency of WG must be high as shown by the ratio WG/Intake = 0.03 g/kJ (nearly twice the value reported in healthy term babies)

Endocrine and metabolic effects of deprivation of enteral feeding in sick pre-term infants.

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Sick pre-term infants often receive only intravenous dextrose during the first days after birth. Little is known on the metabolic and endocrine consequences of such practice. We have measured, with ethical approval, plasma concentrations of gut and pancreatic hormones and of blood intermediary metabolites in 1) ten 6-day old infants (mean gestation 33 ± 1.0 weeks, birthweight 1875 ± 245 gm) with hyaline membrane disease, who received routinely no enteral nutrition since birth, being maintained solely on 5% dextrose I.V. and 2) forty six 6-day old healthy infants (mean gestation 33.5 ± 0.1 weeks, birthweight 1980 ± 60 gm) bolus fed entirely on human milk. Blood samples were taken in group 2 either pre-prandially or at 30, 60, or 120 mins after the feed. Compared with the unfed group enterally fed infants had significantly higher pre-prandial concentrations of enteroglucagon, motilin, neurotensin, gastric inhibitory polypeptide, gastrin, glucagon, B-hydroxybutyrate, glycerol and alanine, and a lower concentration of secretin. In enterally fed infants, significant post prandial changes occurred only in plasma insulin and motilin and in blood glucose levels. Thus the metabolic and endocrine milieu is profoundly affected in infants deprived of enteral feeding. We hypothesise that most of these differences relate to the absence of intra-luminal nutrients in the gut and that the different metabolic and endocrine status of unfed infants could have long-term consequences.

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Supporting Bereaved Parents following Perinatal Death.

It is thought important to offer emotional support to parents bereaved in the perinatal period. To evaluate this, a study has been planned in which bereaved parents are randomly allocated to a control (C) group, or a supported (S) group, and their emotional state assessed 6 and 12 months later. Currently 15C and 16S families have entered the study and 4C and 4S assessed at 6 months. A report will be presented of hospital routine in Group C and extra support given in group S with preliminary results of the 6 month follow up. A tangible result of the study so far has been identification of complicated and emotionally-charged administrative procedures which involve parents shortly after bereavement. These include:- simultaneous registration of birth and death; collection and delivery of the certificate of disposal; and choosing the funeral arrangements particularly given the uncertainties of hospital funerals; can the parents attend? How many babies in one grave? Is a coffin used? Is a funeral service held? Can the grave be found afterwards? Clarification of these points is important for all the staff in a maternity hospital and has enabled the child psychiatrist to give practical help to group S and thus be placed in a position to offer more general emotional support.

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