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PLASMA AMINO ACIDS (AA) LEVELS IN NEWBORN PIGLETS EXPOSED TO HYPOXEMIA (HO) AND HYPOVOLEMIA (HV). Jan-P. Odden, Ellen Roll, Tor Haugstad, Iver A. Langmoen, Dag Bratlid. Depts.Ped., Surg. Res. and Neurosurg., Rikshospitalet, University of Oslo, Norway.

Plasma concentrations of five AA (asparate ASP, glutamate GLU, glycine GLY, taurine TAU, and gamma-amino-butyric acid GABA were measured in arterial (a) and sagittal sinus (v) plasma samples in nine piglets exposed to HO(10% O_2) and HV (bleeding 20%). Samples were taken at baseline (BL), during HO, after HV, and 30 (30') and 60 min (60') after HO.

Results I: (percent change from BL, a samples, mean±SEM).

	ASP	GLU	GLY	TAU	GABA
HO	4.5±9.7	-1.5±12.8	18.6±11.4	55.1±17.3§	28.7±31.9
HV	43.5±28§	50.0±11.9§	20.0±1.3	41.9±13.3§	-20.8±19.4
30'	8.2±9.7	42.6±17.2§	19.5±12.1	24.0±12.7	28.1±27.7
60'	18.1±16.2	82.4±26.9§	53.0±18.3§	71.1±52.0§	27.4±24.0

§ p<0.05

Results II: ▲(v-a) (micromol/l, mean ± SEM):

	BL	HO	HV	30'	60'
ASP	-0.4±1.5	13.1±7.1*	10.4±12.8*	1.4±1.7	1.9±1.9
GABA	0.5±0.4	-0.8±0.5	1.1±0.8	-0.3±0.2	-0.6±0.8

* p=0.11

A generalized increase in AA were seen after HO and HV, particulary in GLU, ASP (HO+HV), and TAU (HO). While GABA showed no change in ▲(v-a), a tendency (p=0.11) was noted for ASP, while GLU, GLY and TAU were not conclusive.

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INSULIN IS NOT THE MAJOR GLUCOREGULATORY HORMONE IN THE NEONATAL PERIOD. Jane M Hawdon, Albert Aynsley-Green, Martin P Ward Platt. Department of Child Health, University of Newcastle upon Tyne, UK.

The glucoregulatory role of insulin for adult subjects is undisputed. However, less is known about its secretion and actions in the neonatal period, either in healthy subjects, or in those at risk of disordered blood glucose homeostasis.

We studied the relationships between blood glucose and plasma insulin concentrations in 52 healthy children, 67 appropriate birthweight for gestational age (AGA) term infants, 39 AGA preterm infants, and 59 infants who were hypoglycaemic or hyperglycaemic. In addition, 26 babies from the latter group underwent glucose turnover studies.

In children and AGA infants, plasma insulin concentration was positively related to blood glucose concentration (Spearman rho, P: Children, 0.58, <0.001; AGA term, 0.31 <0.01; AGA preterm, 0.44, <0.01). However, at equivalent glucose concentrations, there was greater variation in insulin concentration and the median insulin concentration was higher in AGA infants than for children. In hypoglycaemic and hyperglycaemic infants, there was no relationship between blood glucose and plasma insulin levels, and, in turn, glucose production rates were not related to plasma insulin levels.

These data suggest that, compared to older subjects, neonatal pancreatic insulin secretion is less closely linked to circulating blood glucose concentrations, and that insulin does not control glucose production rates in infants with disorders of blood glucose homeostasis.

EPIDEMIOLOGY

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BLOOD PRESSURE AND EARLY GROWTH: A REFLECTION OF PRE OR POSTNATAL INFLUENCES? Law CM, Barker DJP, Cruddas AM, Osmond C. MRC Environmental Epidemiology Unit, University of Southampton.

Birthweight is inversely related to blood pressure, but there is debate over whether this depends on influences acting during prenatal life, or adverse experiences in postnatal life which are associated with low birthweight. We have examined the relations of prenatal growth and growth in the first year of life to blood pressure in children and adults.

The Brompton study measured growth and blood pressure annually from birth to 10 years in a population sample of 1797 children. The Hertfordshire study measured blood pressure at mean age 64 years in a population sample of 841 men whose birthweight and weight at one year were known.

In children and adults blood pressure was negatively related to birthweight. The strength of this negative relation increased with age: the increase in systolic pressure (mm Hg) per kilogram decrease in birthweight was 1.0 (standard error 0.7) at 3 years, 1.6 (standard error 0.6) at 8 years and 4.0 (standard error 1.4) at 64 years. After taking account of birthweight, blood pressure was not related to growth during the first year of life.

These analyses suggest that the relation of birthweight with blood pressure reflects prenatal rather than postnatal influences. Augmentation of blood pressure, described in secondary hypertension, may explain the increasing effect of birthweight on blood pressure as age increases.

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THE CRIB (CLINICAL RISK INDEX FOR BABIES) SCORE: A TOOL FOR EPIDEMIOLOGICAL STUDIES IN VERY LOW BIRTHWEIGHT INFANTS. William Tarnow-Mordi, Gareth Parry, Simon Ogston. Ninewells Hospital and Medical School, University of Dundee, UK.

Most neonatal deaths occur in infants of very low birthweight (VLBW: <1500 g), who thus provide a good index group for comparing the performance of neonatal units. However, comparisons of neonatal outcome are unreliable unless adjusted for differences in the degree of initial risk between populations. With the method used in the PRISM score (Crit Care Med 1988;16:1110-16) we developed a score from regression coefficients of 4 independent variables describing clinical risk and disease severity: birthweight, gestation, and mean FiO_2 and mean pH in the first 12 hours of life. Scores were closely related to hospital deaths in 197 VLBW infants in 2 UK tertiary neonatal units (Reference Dataset):

CRIB SCORE	0-5	6-10	11-15	>15	
No. infants	134	20	23	20	
Deaths	6%	35%	78%	100%	p < .00001

Az (area under the receiver operator curve) = 0.92.

Results in an independent sample of 164 VLBW infants in another UK tertiary neonatal unit (Validation Dataset) were:

CRIB SCORE	0-5	6-10	11-15	>15	
No. infants	128	25	8	3	
Deaths	6%	48%	75%	100%	p <. 00001

Az = 0.88.

Risk-adjusted mortality did not differ significantly between the first and second populations. These data suggest that it is feasible to develop an accurate scoring system to quantify initial clinical risk in VLBW infants.

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TRANSIENT NEONATAL HYPOTHYROXEMIA MAY CAUSE NEUROLOGICAL IMPAIRMENT. S. Pauline Verloove-Vanhorick, R. Brand, A.M. Schreuder, M.H. Ens-Dokkum, S. Veen. Department of Child Health, TNO-Institute for Preventive Health Care, Leiden, The Netherlands.

Objective: to study the relationship between neonatal thyroid function and neurological outcome.

Methods: In 632 children born with gestational age < 32 weeks and/or birthweight < 1500 g (part of the POPS-study 1983), T4 values from the neonatal screening program on congenital hypothyroidism (day 5-17) were available as well as data on neurological impairment (Minor Neurological Dysfunction (MND, n=126) or Cerebral Palsy (CP, n=68). Univariate (parametric and non-parametric 1-way Anova) and multivariate analysis (logistic regression analysis) were performed relating T4 to neurological impairment as outcome measure.

Results: the mean T4 value was lower in MND and in CP (Kruskal-Wallis: p=0.06; parametric Anova: p=0.05). This relationship was confirmed in the multivariate analysis; after correction for 10 possible confounding factors, a significant association was found between low T4 and neurological impairment (adding T4 as a continuous variable to the model with those 10 variables improved the fit significantly: likelihood ratio 4.1, p=0.04). In a subpopulation of 228 children with known grading of ICH, severity of ICH was found not to influence this association when added to the set of confounders.

Conclusion: transient neonatal hypothyroxinemia may be one of the preventable factors contributing to neurological impairment in preterm infants.

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QUALITY OF LIFE FOR CHILDREN WITH COMPLEX CONGENITAL HEART DISEASE.

Francis Casey, Connor Mulholland and Brian Craig,
Department of Paediatric Cardiology, Royal Belfast Hospital For Sick Children, Belfast, N.Ireland

The quality of life was evaluated in twenty six children with surgically palliated complex congenital heart disease. Physical assessment included documentation of symptoms, calculation of an activity score and formal exercise testing. Social competence, behaviour, and educational difficulties were studied using the Achenbach Child Behaviour Checklist. An age and sex matched control group of thirty children with innocent murmurs was evaluated by the same protocol.

The majority of the study group had moderate limitation of exercise tolerance (mean maximal exercise time 7.1 minutes) with three patients having severe limitation of exercise. Two children were unable to attend school and eight attended only part-time. Behavioural disturbance was found in 22% of the study group as compared to 6.9% of controls ($p<0.05$). In particular those with complex heart disease displayed social withdrawl ($p<0.001$), but not depression or diminished self-esteem.

Conclusion: Despite limited participation in normal childhood activities most patients had good self-esteem. Quality of life was impaired in some cases by difficulties with social interaction.