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LOW BIRTHWEIGHT AND MATERNAL ASTHMA. RESULTS OF A CROSS-SECTIONAL SURVEY IN SCHOOLCHILDREN

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The relationship between airway responsiveness in the mother and low birthweight and/or preterm delivery is debated (N Engl J Med 1985; 312: 742-5. Arch Dis Child 1983; 63: 905-10). In order to study whether maternal asthma is associated with a higher risk of low birthweight, we analysed the data of a cross-sectional survey in 2929 schoolchildren aged 6-11, randomly selected from three areas in the Lazio Region: the city of Rome (RO), an industrial town (CV), and a rural area (VT). Overall 4.9% of children had a low birthweight (<2500g). A history of asthma in the mother was positively associated with a higher prevalence of low birthweight (OR=2.9; 95%CI= 1.2-6.9). After stratification for place of residence this association disappeared for RO and VT, but became stronger in the 955 children from CV (OR=10.2; 95%CI=3.0 -33.0). Moreover, in CV the effect of maternal asthma on low birthweight was particularly important in case of maternal illiteracy (OR=27.7; 95%CI=2.0-621.5) and when the mother had smoked during pregnancy (OR=16.7; 95%CI=2.1-136.4). These results suggest that the causal relationship (if any) between asthma in the mother and low birthweight is not a simple one, and that probably most important are the interactions between maternal asthma and other environmental and social factors.

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COMPUTER-BASED PERINATAL RISK PREDICTION IN A GEOGRAPHICALLY DEFINED PARTURIENT POPULATION. AN INTERVENTION STUDY

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The risk of unfavourable perinatal events for a parturient population was predicted by a computer-based method and those at risk, 17.6 % of the total, were given recommendations for special care. The series consisted of the total parturient population in Northern Finland in 12 consecutive months in 1985 and 1986. Of the 96 antenatal clinics in the study area, a half were chosen as intervention clinics and the other half as control clinics matched in the number of deliveries in previous years, geographical location, urban or rural character and degree of development. The total number of deliveries in the intervention group was 3653 and that in the control group 4095. Those classified in the risk group and given recommendations for extra care, 642 mothers, had a significantly higher mean birth weight, a lower percentage of low birth weight infants and an almost significantly (p 0.070) lower percentage of pre-term deliveries than the mothers at similar risk in the control group without any such extra recommendations.

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ELEVEN YEARS OF SCREENING ON TETRAHYDROBIOPTERIN DEFICIENCY: THE ZURICH EXPERIENCE

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Tetrahydrobiopterin (BH_4) deficiency comprises a group of very rare diseases characterized by progressive neurological symptoms unresponsive to treatment with low-phenylalanine diet. 6-Pyruvoyl-tetrahydropterin synthase deficiency, the most common form of BH_4 deficiency, occurs in various clinical forms which are sometimes hard to distinguish. This complicates the screening of newborns, prenatal diagnosis, and the determination of heterozygote carriers. Beside the severe, the peripheral, and the transient forms there might be other variants only marginally characterized. In dihydropteridine reductase deficiency, the second most common form of BH_4 deficiency, various point mutations have been observed. Recently a new form of hyperphenylalaninemia, primapterinuria, with excretion of 7-substituted pterins in urine was described. This form of hyperphenylalaninemia may be due to carbanolamine dehydratase deficiency.

As a result of the Central European screening carried out in our laboratory during the last 11 years approx. 1300 patients with hyperphenylalaninemia have been tested, of which 970 are newborns. 79 patients with BH_4 deficiency were discovered. Of these 79 patients 2 suffer from GTP cyclohydrolase I deficiency, 48 from 6-pyruvoyl-tetrahydropterin synthase deficiency (5 with a peripheral defect), 22 from dihydropteridine reductase deficiency, and 7 from primapterinuria.

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NEUROMUSCOLAR INVOLVMENT IN TWO UNRELATED CHILDREN WITH LONG-CHAIN 3-HYDROXYACYL-CoA DHEYDROGENASE (LCHAD) DEFICIENCY.

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LCHAD is an intermediary enzyme of mitochondrial fatty acid oxidation. Only two patients with LCHAD deficiency have been described so far presenting SIDS and hypoketotic hypoglycemia with reversible myopathy (Wanders, Hale). We report on two LCHAD deficiency patients with prominent neuromuscular symptoms that are summarized in the table.

	p.1	p.2	Wanders	Hale
PERIPHERAL NEUROPATHY	+	+	-	-
PIGMENTARY RETINOPATHY	-	+	-	-
MYOPATHY	+	+	-	+
MYOGLOBINURIA	+	-	-	-
CARDIOMYOPATHY	+	+		+
HYPOKETOTIC HYPOGLYCEMIA	-	+	+	+
LIVER DYSFUNCTION	-	+	+	+
LCHAD % ACTIVITY	30	5	29	21

Patient 2 died at age 10 m. for cardiorespiratory failure. Nerve biopsy showed demyelination and wallerian degeneration and in the muscle biopsy there was lipid storage and necrosis. Peripheral neurophaty has never been described in fatty acid oxidation disorders.

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OXYGEN METABOLITES INITIATE PROSTANOID SYNTHESIS AND PULMONARY VASOCONSTRICTION IN YOUNG PIGS. Jon Sanderud, Kristian Bjøro and Ola D. Saugstad. Inst. for Surg. Research, Inst. of Clin. Biochem. and Depts of Pediatrics and Pediatric Research, Rikshospitalet, Oslo, Norway.

The effects of the hypoxanthine (Hx)-xanthine oxidase (XO) system on the pulmonary circulation and prostanoid synthesis in young pigs were investigated. The pulmonary blood-flow and pressures were recorded continuously, and the cyclooxygenase metabolites TxB2 and 6 keto PgF1a measured at regular intervals (RIA). Five groups were studied: 1)Pigs given XO bolus dose IU/kg into the right atrium. 2)Pigs pretreated with Hx 10 mmol/l before XO. 3)Pigs given indomethacin 7.5 mg/kg and XO. 4)Pigs given allopurinol 50 mg/kg and XO. 5)Pigs given catalase 25.000 U/kg and XO during experiments. The table shows relative increase from baseline levels 25 min after XO, when maximum pulmonary vasoconstriction (PVR), was recorded. (±SD) * p< 0.05 ** p< 0.01 vs group 1

Group	PVR % inc	TxB2 % inc	6 keto PgF1a % inc
1)(n=6)	126.8 (32.7)	53.6 (13.7)	29.0 (36.3)
2)(n=5)	142.9 (78.1)	59.0 (52.9)	4.0 (36.4)
3)(n=6)	15.5 (20.6) **	0.0 (0.0) **	0.0 (0.0) **
4)(n=5)	60.0 (43.1) *	-5.5 (5.2) **	22.6 (21.9)
5)(n=6)	42.4 (20.8) **	-11.4 (4.6) **	4.3 (29.6)

The study shows marked PVR increase in groups 1 and 2. This effect was attenuated in groups 3,4 and 5 where prostanoid changes were minimal. We therefore speculate that oxygen radicals trigger the arachidonate acid cascade to induce the described PVR respons.

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D-PENICILLAMINE ATTENUATES OXYGEN RADICAL INDUCED PULMONARY HYPERTENSION IN PIGS. György Oroszlán, Jon Sanderud and Ola D. Saugstad. Dept. of Pediatrics Madzar Jozsef County Hospital, Salgotarján, Hungary, Inst. for Surg. Research and Depts. of Pediatrics and Pediatric Research, Rikshospitalet, Oslo, Norway.

Pulmonary vasoconstriction was induced in six pigs by a bolus infusion of xanthine oxidase (XU) 1 U/kg into the right atrium. Pulmonary pressure and blood flow were recorded and the pulmonary vascular resistance (PVR) calculated. The stable arachidonate acid metabolites TxB2 and 6 keto PgF1a measured at regular intervals. Another six animals were pretreated with d-Penicillamine (d-P), 50 mg/kg i.v. before XO administration. Results: The table shows relative increase from baseline values at maximum PVR, 25 minutes after XO was given. (±SD)

Treatment	PVR % inc	TxB2 % inc	6 keto PgF1a % inc
XO	126.8 (32.7)	53.6 (13.7)	29.0 (36.3)
d-P+XO	48.2 (40.8) *	8.9 (15.8) **	15.7 (27.1)

The study shows that d-P potently inhibits XO induced pulmonary vascular resistance and XO induced prostanoid synthesis. The biological action of this pharmacological agent is unknown, but the data suggest that d-P may be a cyclooxygenase inhibitor or an oxygen radical scavenger. Could d-Penicillamine be used in the treatment of pulmonary hypertension in the newborn?

* p< 0.05 ** p< 0.01 vs XO group.