● 247

CARDIAC OUTPUT AND HYPOTENSION IN PRETERM INFANTS WITH RESPIRATORY DISTRESS SYNDROME. Frans J. Walther, Susanna L. Lopez and John O. Leighton. Dept. of Pediatrics, UCLA School of Medicine, M.L. King Jr. Hosp./Drew University Medical Center, Los Angeles.

To evaluate the effects of inotropic support on cardiac function and blood pressure in preterm hypotensive infants, we compared 56 preterm infants with respiratory distress syndrome (RDS) ($\text{FiO}_2 > 40\%$) to 27 preterm infants without RDS at 8-72 h of age. In the controls, mean $\pm$ SEM birth weight was 1285 ± 47 g, gestational age 30.9 ± 3 wks, mean blood pressure (MBP) 45 ± 1 mm Hg, CO 319 ± 11 ml/min/kg, and systemic vascular resistance (SVR) 132 ± 7 mm Hg/L⁻¹/min/kg. In the RDS group, these values were 1050 ± 45 g ($p < 0.001$), 28.9 ± 4 wks ($p = 0.002$), 36 ± 1 mm Hg ($p < 0.001$), 358 ± 15 ml/min/kg, and 107 ± 8 mm Hg/L⁻¹/min/kg. 26 (46%) RDS infants received dopamine, in 12 (21%) combined with dobutamine, and 29% had a MBP ≤ 30 mm Hg. CO in hypotensive and normotensive RDS infants was similar. In the RDS group, MBP was 37 ± 3 mm Hg and SVR 243 ± 51 mm Hg/L⁻¹/min/kg in the low CO (≤ 250 ml/min/kg) subgroup and 32 ± 2 mm Hg and 52 ± 4 mm Hg/L⁻¹/min/kg in the high CO (≥ 410 ml/min/kg) subgroup ($p < 0.001$ vs controls). Treatment of RDS infants with dopamine or dopamine + dobutamine raised MBP to values similar to those not receiving inotropic support, but addition of dobutamine significantly increased CO and reduced SVR. These data indicate that whereas dopamine mainly affects blood pressure, dobutamine added onto dopamine simultaneously increases CO, leading to a reduction in SVR.

▲ 248

ANTIOXIDANT-SURFACTANT LIPOSOMES INCREASE PULMONARY ANTIOXIDANT ACTIVITY IN PRETERM AND TERM RABBITS. Frans J. Walther, Remy David-Cu and Susanna L. Lopez. Dept. of Pediatrics, UCLA School of Medicine, M.L. King Jr. Hosp./Drew University Medical Center, Los Angeles.

Surfactant liposomes, encapsulating superoxide dismutase (SOD) and catalase (CAT), increase alveolar type II cell antioxidant activity and protect against oxidant stress (AJP 1993;265:L330). We examined whether intratracheal instillation of antioxidant-surfactant liposomes (ASLipos) increases lung antioxidant activity in 28- and 29-d gestational age and term rabbit fetuses. New Zealand White rabbits were delivered by cesarean section and pups received 0.1 ml/15 g birth weight of ASLipos by intratracheal injection and hyperoxia ($>95\%$ oxygen) for 24 h; an equal amount of surfactant liposomes without antioxidants (SLipos) and hyperoxia for 24 h; or were sacrificed at birth. After sacrifice, lung homogenates were investigated for SOD and CAT activity (mean $\pm$ SD U/mg protein; * $p < 0.05$ vs controls):

	Controls: SOD	CAT	ASLipos: SOD	CAT	SLipos: SOD	CAT
28d	1.7 ± 0.6	13 ± 7	$2.1 \pm 0.3^*$	$22 \pm 10^*$	1.7 ± 0.5	16 ± 9
29d	2.1 ± 0.2	18 ± 4	$3.5 \pm 1.0^*$	$29 \pm 13^*$	2.3 ± 0.9	20 ± 5
term	3.0 ± 0.2	26 ± 10	$4.3 \pm 0.7^*$	$38 \pm 10^*$	3.0 ± 0.3	28 ± 9

Intratracheal instillation of antioxidant-surfactant liposomes at birth boosts pulmonary antioxidant capacity in preterm and term rabbits exposed to hyperoxia.

▲ 249

RED CELL VOLUME DETERMINATION IN ANAEMIC FETUSES AND NEWBORN INFANTS REQUIRING TRANSFUSION, USING FLOW CYTOMETRY: DILUTION PRINCIPLE.

Wardrop G.¹, Dixon S.³, Dawson A.², Hoy T.¹, Fisher J.¹, Trevett D.¹, Jones J.G.², Ismail S.⁴, Wynn R.¹.
Depts Haematology¹ & Obstetrics², UHW Cardiff CF44XN and Paediatrics³ & Haematology⁴, Singleton Hospital Swansea
Dept of Biochemistry⁵, University of Wales Cardiff CF11ST

Determination of pre-transfusion (Tx) red cell volume (mass) [RCV] in fetuses with Rh haemolytic disease and in anaemic infants helps assessment of Tx need and allows blood volume calculation. Neonates' RCV can be measured at Tx using dilution of autologous HbF by donor adult Hb, provided at least 20% of the Hb is fetal. We report an analogous method, using 0.1 ml blood samples, based on FACS - determined falls in RhD positive cells at Tx with D negative cells.

Pre Tx RCV = vol of red cells transfused X post Tx percentage Rh D positive/Pre- minus post- Tx percentage RhD positive.

The methods give comparable results (Neither the ranked pair differences nor the median of the two samples were significantly different; $n=10$, $p < 0.05$). Our new method is reliable after smaller-volume Tx than possible using the Hb F dilution method. This investigation is placing Tx schedules in these patients on a more rational basis than previously possible.

▲ 250

RANDOMIZED PLACEBO-CONTROLLED TRIAL OF THYROXINE ADMINISTRATION TO INFANTS OF LESS THAN 30 WEEKS GESTATIONAL AGE IN RELATION TO MORTALITY AND MORBIDITY.

Aleid G. van Wassenaer*, Joke H. Kok*, Jan J.M. de Vijlder** Departments of *neonatology and **experimental pediatric endocrinology, Academic Medical Centre, Amsterdam, The Netherlands.

BACKGROUND: Transient hypothyroxinemia is a very frequent occurring phenomenon in very preterm infants. Low T4 levels are related to poor developmental outcome. However, T4 treatment in very preterm infants is still controversial. **AIM:** To improve developmental outcome at 24 months. Preliminary analysis of clinical outcome is now presented. **METHODS:** 193 infants <30 wks GA were randomly assigned to T4(T)- or placebo(P) treatment, which was started 12-24 hrs after birth in a dosage of 8 μ g/kg birthweight/day during the first 6 weeks after birth. **RESULTS:** The T- and P-groups did not differ regarding the following items: Mean GA, mean birthweight, number of SGA-infants, sex ratio, mean APGAR-score at 5', and use of antenatal steroids.

	T4	PLACEBO	REL.RISK, p
n	96	97	
†	15%	21%	0.67, p=0.2
RDS	53%	55%	0.97, p=0.8
surfactant	38%	39%	0.96, p=0.8
BDP	40%	42%	1.01, p=0.95
O2 at 36 wks	17%	22%	0.75, p=0.38
ODB	21%	30%	0.69, p=0.14
NEC	1%	3%	0.34, p=0.3

CONCLUSIONS: This is the first large trial of T4 supplementation in preterm infants, studying the short- and longterm effects of thyroxine treatment. Although we did not find a statistically significant improvement of mortality and morbidity, T4 treated infants tended to have better survival and less clinical problems. A multi-centre trial is needed to investigate the importance of our clinical outcome data.

▲ 251

PSYCHOTHERAPEUTIC APPROACH IN THE TREATMENT OF ASTHMATIC CHILDREN SUFFERING FROM EMOTIONAL DISORDERS

Marlise Weder, Richard Kraemer
Department of Paediatrics, University of Berne, Inselspital, CH-3010 Berne, Switzerland

The perception of respiratory symptoms in asthmatic subjects as well as their exacerbation onto veritable attacks may be related to psychosocial conditions. Asthmatic symptoms may especially be maintained by the vegetative lability in children with emotional disorders. The aim of the present study was to show whether the course of asthma in such children can be influenced by psychotherapy. Eleven emotionally disturbed (DSM IIIR) children with insufficiently controlled asthma underwent individual psychotherapy for 3-12 months. As control group 15 children from a previous study were taken. There was no difference in age, sex, allergies, lung function, and initial drug use between the two groups. The lung function testing was performed at months 0, 3, 6, 9, and 12. Thoracic gas volume (TGV), airway resistance (Raw), forced expiratory volume (FEV₁) and maximal expiratory flow at 50 % vital capacity (MEF₅₀) were measured. Whereas pulmonary hyperinflation (TGV) decreased in both groups ($p < 0.01$), significant improvement of airway function (FEV₁: $p < 0.05$; MEF₅₀: $p < 0.05$) was only observed in the study group. Also drug consumption and hospital admissions were significantly reduced in the study group. It is concluded, that psychotherapy can improve the course of the somatic disease in some asthmatic children with emotional disorders.

▲ 252

INTELLECTUAL OUTCOME AND CRANIAL MRI-FINDINGS IN PATIENTS WITH PERSISTENT HYPERPHENYLALANINEMIA (HPA)

Josef Weglage, Kurt Ullrich, Birgit Fünders, Michael Pietsch, Hans-Georg Koch, Agnes v. Teeffelen-Heithoff
Department of Pediatrics, University of Münster, Germany
On behalf of the German PKU-Collaborative Study

The intellectual outcome of patients with HPA (serum phe levels under free diet < 600 μ mol/l) was not systematically studied so far. Therefore we tested 31 patients (age: 22 ± 4 years) for IQ (WAIS-R) and school performance. In addition cranial MRI (1.5 T unit) was obtained in 10 of these patients. The patients reached a normal IQ ($X=102$, $SD=15$; normal population: $X=100$, $SD=15$). They neither started school later than their siblings nor did they repeat classes more often, and they went to the same types of schools. The evaluation of patients' MRIs revealed no abnormalities in any case.

Our results indicate that untreated patients with persistent HPA are not at risk for developing deficits in intellectual performance and white matter changes, as described for patients with treated mild or classical PKU. From this point of view a dietary treatment is not necessary in patients with HPA, as recommended most recently (1).

1. British Medical Working Party on PKU (1993).
New British Recommendations for the Management of PKU.
Arch Dis Child, 68: 426 - 427