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LONG TERM EFFECTS OF SUSTAINED INFLATIONS (SI) ON LUNG FUNCTION IN PRETERM NEWBORN LAMBS.

Ineke Klöpping, Wiel Maertzdorf and Carlos Blanco, State University Limburg, Dept. of Neonatology, Maastricht, The Netherlands.

We studied the possibility to improve lung distensibility by SI during the first hours of age. Preterm newborn lambs (128-133 days of gestational age, n=70) were used. Initially all lambs were mechanically ventilated with 100% O₂, peak inspiratory pressure (PIP) was adjusted for PaCO₂. For SI the ventilator was disconnected and the lungs were inflated during five seconds at a PIP of 25 or 35 cmH₂O with a mixture of 5% CO₂ and 95% O₂. Each inflation was followed by positive end expiratory pressure of 5 cmH₂O for 5 seconds. This procedure was repeated three times. SI was applied in three groups: 1) within 15 minutes after birth, 2) within 15 minutes after birth and repeated each hour for 3 hours 3) at 4 hours of age. Two control groups (4 and 5) were formed, 4) as group 1, except that during disconnection the lungs were inflated at the same pressure as for SI, but with short inspiratory time, 5) lambs were ventilated without any manipulation. Blood gas samples were taken every 30 minutes. Compliance (Cl) was calculated from the injected volume of air per kg wet body weight needed to obtain a pressure of 20 cmH₂O.

Results (mean±SEM) at 8 hours after birth:
 Group 1 (n=19) 2 (n=18) 3 (n=8) 4 (n=18) 5 (n=7)
 PaO₂ (kPa) 29.8±3.8 34.1±5.3 40.3±7.5 28.6±4.5 26.7±8.1
 PIP (cmH₂O) 26.1±2.0 23.8±2.0 22.6±2.4 26.9±2.6 26.5±2.6
 Cl (ml/cmH₂O/kg) 0.7±0.03 0.7±0.05 0.7±0.03 0.7±0.07 0.7±0.13
 pneumothorax 7 5 3 6 1
 In summary, SI as used here showed no significant changes in compliance or blood gas exchange at 8 hours of age.

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EFFECTS OF PARTIAL PLASMA EXCHANGE TRANSFUSION (PPET) ON PERIPHERAL AND CEREBRAL BLOOD FLOW VELOCITY IN POLYCYTHEMIC NEWBORN INFANTS. Wiel J. Maertzdorf, Geert J. Tangelder*, Dick W. Slaaf**, Carlos E. Blanco. University of Limburg, Depts. of Neonatology, Physiology* and Biophysics**, Maastricht, The Netherlands.

Cerebral blood flow velocity (CBFV) is decreased in polycythemic newborns and it normalizes after PPET. To study the influence of polycythemia on peripheral blood flow velocity (PBFV) we measured PBFV and CBFV in 17 polycythemic newborns. Nine normocythemic infants served as controls. Blood flow velocity was measured prior to and at 3 and 24 hrs after PPET in the study group and at 3 and 24 hrs after birth in the controls. Flow velocities were recorded with a 5MHz bidirectional continuous wave velocimeter. Hct decreased from 72.5±4.0% to 59.0±1.5% after PPET. Peripheral mean flow velocity (AUC⁰) in polycythemic newborns did not differ from controls. Cerebral mean flow velocity was decreased in polycythemic newborns and normalized after PPET.

MEAN FLOW VELOCITY	control group	P before PPET	after PPET	P
brachial artery	24±6	NS	23±8	29±13 NS
femoral artery	66±26	NS	52±31	68±30 NS
anterior cerebral artery	142±29	*	112±47	154±53 *
mid cerebral artery	161±50	*	130±44	164±49 *

NS = Not Significant * P<0.05 ° AUC = Area Under the Curve
 Values at 24 hrs did not differ from values at 3 hrs. These data show that blood flow velocity is regulated by different mechanisms in different vascular systems.

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NEONATAL POLYCYTHEMIA: HEMODILUTION WITH SALINE VS SERUM. EFFECTS ON HEMATOCRIT, BLOOD- AND PLASMA VOLUME. Roithmaier A, Arlettaz R*, Bauer K, Bucher H*, Krieger M, Duc G*, Versmold HT. Neonatology, Munich, FRG, and Zürich*, CH

We compared the effects of isovolumetric hemodilution (HD) with saline (n=8) and human serum (n=8) on venous hematocrit (Hct), plasma volume (PV, Evans Blue), blood volume (BV), and total plasma protein (TPP) in 16 term neonates with venous Hct>0.65. The exchange volume was 80 ml/kg x (Hct-55)/Hct, aiming at Hct 0.55. Results (±SD)

Variable	Group	Before HD	End of HD	4h after HD
Hct (l/l)	serum	.71±.04	*** .55±.07	.55±.06
	saline	.69±.02	*** .59±.03	.60±.04
BV (ml/kg)	serum	102±13	101±23	101±25
	saline	98±21	** 88±27	85±24
PV (ml/kg)	serum	37±5	47±16	48±18
	saline	38±8	38±14	35±12
TPP (g/l)	serum	60±5	* 55±5	57±7
	saline	56±4	*** 48±5#	* 55±7

***p<0.001 **<0.01 *<0.05 (paired t-test); # p=0.05 serum vs saline (unpaired t-test)
 Isovolumetric HD with saline resulted in a smaller (p<0.05) decrease in Hct than HD with serum and was not associated with an isovolemic substitution of withdrawn blood, but with a decrease of BV at the end and 4h after HD, because saline left the intravascular space already during HD.
 Conclusion: Rapid loss from the intravascular volume and the decrease of blood volume make saline less effective for HD in neonatal polycythemia and possibly for volume substitution in general.

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MYOCARDIAL DEPRESSION WITH PHENOBARBITAL (PB) MAY AFFECT CEREBRAL HAEMODYNAMIC DURING HYPOXEMIA: P. MONIN, A. CORTEY, J.M.HASCOET, P. VERT, INSERN U272, FACULTE DE MEDECINE, UNIVERSITE DE NANCY I, FRANCE

PB proposed to reduce brain damage after birth induce also cardiac depression. To analyse the effects of PB on cerebral and systemic haemodynamics during hypoxemia. 15 piglets (< 10 days) paralysed (Pancuronium 0.1 mg/kg) and ventilated are studied (Gr I. PB 20mg/kg, n=7, Gr II, controls, n=8). Cerebral blood flow (CBF) and cardiac index (CI) are measured (micro spheres) at baseline and during hypoxemia (CO exposure). MABP, PaO₂, PaCO₂, pH, SaO₂ and available Hb for O₂ transport (Hba: total Hb minus HBCO) are evaluated for moderate (Hba 1/3 to 2/3 of Hb total) and severe hypoxemia (Hba < 1/3 of total Hb). Stroke volume (SV) heart rate (HR) and double product (DP: systolic BP x HR) assessing myocardial oxygenation are calculated

	HR(bpm)	SV (ml)	DP	CI(ml/kg/min)	CBF(%)	Hba(nmol/l)
Baseline	252±32	1.11±.43	24778±5679	280±110	100	4.46±.81
	166±33	1.15±.49	25331±4856	313±138	100	4.54±.42
Moderate	277±21	1.24±.58	24436±3306	346±165	170±35	1.93±.60a
	267±23	1.36±.55	21020±1840	360±132	182±81	1.85±.60a
Severe	193±17	.71±.51c	15214±4436c	168±144b	140±65	.79±.24a
	229±77	1.03±.94	16775±4192	235±208	232±146a	.82±.23a

For moderate hypoxemia, CBF is increased in the 2 groups. In severe hypoxemia, CBF rose further in gr II only. In gr I CI and DP were significantly decreased. These data suggest that for severe hypoxemia PB may significantly affect cerebral haemodynamics in relation to myocardial depression. a:p<0.005, b:p<0.1 vs baseline, c:p<0.01 vs moderate hypoxemia

MATERNAL-INFANT TRANSMISSION OF HCV INFECTION.

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Giovannini M, Zuccotti GV, Fiocchi A, Longhi R, Riva E, Tagger A*.

*5th Pediatric Department - University of Milan
 *Institute of Virology - University of Milan

If vertical transmission is an important mode of spread of HIV and HBV infections, it is not known to what extent vertical transmission of blood-borne non-A, non-B hepatitis (NANBH) agent(s) occurs. To determine the possible HCV vertical transmission we followed HCV antibody levels in 26 infants born to HCV/HIV positive mothers. All children have been followed since birth by serial determination at 0, 1, 3 months and every three months thereafter. Antibody to HCV were tested by an Elisa method (Ortho Diagnostic Systems, N.J. USA) on stored frozen sera. In all children maternal HCV antibodies declined to undetectable levels within 2-4 months of age. In 5/26 (19.2%) an active production of HCV antibodies was observed 3-4 months after an elevation of serum ALT values. The diagnosis of NANB hepatitis was made according to the usual exclusion criteria. Thus, contrary to previous reports, our data suggest that a vertical transmission of HCV infection is possible and frequent at least in children of HIV positive mothers.

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LIPID AND APOPROTEIN LEVELS IN OBESE SCHOOL CHILDREN. Bellù R, Ortisi MT, Scaglioni S, Incerti P, Mantaut M, Galluzzo C and Giovannini M. Department of Pediatrics, University of Milan, Italy

We investigated the relation between obesity and lipid and apoprotein levels in 286 children, 6-14 years aged, 133 males and 153 females (16.5% with obesity). Weight, height and skinfolds were calculated for each child. Serum samples were collected after 12 hours fast; total cholesterol (TC), triglycerides (TG) and HDL cholesterol (HDLc) were determined by an enzymatic, dry multilayer method (Kodak Ektachem DT60); LDL cholesterol (LDLc) was calculated by Friedewald's formula; apoprotein B (ApoB) and AI (ApoAI) were measured by a nephelometric method. We considered obese a child with an overweight>20% ideal weight. Statistical analysis was performed by two way (sex and obesity) analysis of variance to test the differences of lipoproteins in male and female obese children. TC and TG were higher in obese children, both in males and females. HDLc was lower in female but not in male obese children; LDLc was higher in obese females. No difference was observed in ApoAI levels, ApoB was higher in female obese children, but not in male ones. In females, the stronger correlation was found between ApoB and % overweight (r=0.31, P=0.001).