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DIFFERENTIAL EFFECTS OF LEUKOTRIENE (LT) C4 AND D4 ON THE CIRCULATION IN NEWBORN LAMBS. Michael D. Schreiber, Michael A. Heymann and Scott J. Solfer. Univ. of Calif., Dept. of Ped. and the CVRI, San Francisco.

LT has been isolated from the lung lavage fluid of infants with persistent pulmonary hypertension (PPHN). LT antagonism with FPL 57231 (Fisons, plc) increases pulmonary blood flow (Q) in fetal lambs and attenuates pulmonary vasoconstriction (PV) with hypoxia in newborn lambs. Circulatory effects of LTC4 and LTD4 (0.01-2.0 mcg/kg) were studied in four unsedated newborn lambs at 5-10d, instrumented to measure systemic (SAP) and pulmonary (PAP) arterial pressures, Q, and heart rate (HR).

	PAP	SAP	Q	HR
Control	13±2	68±10	299±68	218±31
LTD4 0.01mcg/kg	14±2	69±11	305±64	216±29
Control	12±2	74±10	320±76	216±11
LTD4 0.5 mcg/kg	26±3*	90±7*	241±66*	167±23*
Control	13±2	66±9	348±84	230±20
LTD4 2.0 mcg/kg	36±7*	94±9*	162±20*	147±41*

N=4; Mean±SD; *P<0.05 vs Control; PAP, SAP, mmHg; Q, ml/min/kg. LTC4 produced similar dose-dependent systemic effects without increasing PAP. Arterial blood gases were unchanged. FPL 57231 (2mg/kg/min) inhibited the effects of LTC4 and LTD4. Atropine did not prevent the decrease in HR and Q, suggesting direct myocardial depression. U63557A (Upjohn), 3mg/kg, a thromboxane (Tx) synthesis inhibitor blunted the LTD4 increase in PAP, but not the systemic effects. Tx may partially mediate LTD4-induced PV. LTD4 increases PAP and SAP while depressing myocardial function. LT may play a role in the pathogenesis of PPHN.

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PROGNOSTIC SIGNIFICANCE OF NEONATAL INTRAVENTRICULAR HEMORRHAGE: FOLLOW-UP RESULTS FROM DISCORDANT TWINS. David T Scott, Laura R Ment, Richard A Ehrenkranz, & Charles C Duncan. (Spon. by Ian Gross.) Yale School of Medicine, Depts Pediatrics, Neurology, Ob/Gyn, & Surgery, New Haven.

During a 3-year period, our newborn service admitted 13 pairs of twins, at least one of whom weighed 1250g or less at birth, and who both survived. All infants were scanned for germinal-matrix hemorrhage (GMH) and intraventricular hemorrhage (IVH). Of the 13 pairs, 11 were discordant for GMH/IVH. Among the 11 pairs, one pair included a child blinded by retinopathy who required special developmental tests; another pair was lost to follow-up after the second visit. The nine remaining discordant pairs received blind administrations of the Bayley Scales of Infant Development at 3, 6, 12, and 18 months corrected age (ie, age calculated from the maternal due date). The mean Bayley Mental Indices were:

	3 mos	6 mos	12 mos	18 mos
GMH/IVH:	99.2	92.9	90.8	84.8
No GMH/IVH:	98.7	93.3	94.4	94.0
	+0.5	-0.4	-3.6	-9.2

Thus, cases with a history of GMH/IVH fell progressively further behind their twins with negative scans; the discrepancy at 18 months corrected age was more than half a standard deviation ($t = 3.35$; $p = 0.01$, two-tailed paired comparison).

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RESPIRATORY TIMING IN NEWBORNS WITH RESPIRATORY DISTRESS SYNDROME (RDS). John H. Seguin, Edward F. Donovan, Uma R. Kotagal. University of Cincinnati Medical Center.

The Hering-Breuer inspiratory inhibitory reflex decreases in activity with increasing gestational age (GA) (JAP 36:426). An intercostal-phrenic inhibitory reflex may be present in the premature with RDS who demonstrates paradoxical rib cage motion (JAP 40:352). Either reflex would decrease inspiratory time (T_i) in premature infants of younger (GA). We tested the hypothesis that T_i is directly proportional to GA in infants with RDS resulting in a greater respiratory rate (f) in the less mature newborn. T_i and f were calculated from nasal or oral flow signals in 6 spontaneously breathing infants with RDS at 6-14 hrs of age. Infants were studied supine during REM sleep using behavioral criteria. Mean T_i and f for a 5 minute period were determined from the flow tracings. Contrary to our hypothesis, T_i decreased with increasing GA ($r = -0.889$, $p = 0.018$).

GA (wks)	T_i (sec, mean ± 1SD)	f (breaths·min ⁻¹ , mean)
28	.40 ± .18	62
31	.41 ± .16	72
35	.34 ± .09	70
35	.30 ± .11	80
36	.31 ± .14	72
36.5	.32 ± .13	81

If inspiratory inhibitory reflexes are more active in the premature newborn of younger gestation with RDS, their effect was not sufficient to produce a smaller T_i when compared to more mature infants. Either these reflexes are not present in infants with RDS or other factors may have a greater influence on respiratory timing.

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CONSIDER LOCATION OF TRANSCUTANEOUS OXYGEN MONITOR ELECTRODE (TCM) WHEN MEASURING SKIN TEMPERATURES IN NEWBORNS. John H. Seguin, Paul H. Perlstein. University of Cincinnati Medical Center.

It is well-known that newborns in skin servo controlled environments are at risk of being over and underheated because of artifacts that may interfere with a thermistor's accurate transduction of temperature. As a corollary, it is likely, therefore that babies can be cold stressed when temperature sensing thermistors are placed too close to a TCM which, by design, causes heating of underlying skin to 43-44°C, and can be presumed by conduction to cause skin heating even beyond the electrode edge. We tested this as a hypothesis with newborns weighing 1030 to 2260g, who were studied once on the third to fifth day of life. 2 groups of 3 YSI series 400 thermistors were arranged over the abdomen at increasing distances from a TCM site (Litton SM 261). Temperatures before and after TCM placement were compared at sites 1), 0.5cm, 2), 1.5cm, and 3), 2.5cm from the edge of the TCM using paired t test analysis. There was a significant increase in mean skin temperature from 36.17±0.08°C to 36.40±0.09°C (+SEM) at 0.5cm from the TCM edge, ($p < .01$). The differences at the other 2 sites were not statistically significant (36.14±0.14 to 36.18±0.13°C at 1.5cm, 36.07±0.19 to 36.09±0.17°C at 2.5cm), although there was a rise of 0.2°C at 1.5 and 2.5cm in one patient. This could prove clinically significant when using some commercially available servo systems which respond to changes as small as 0.1°C. Therefore, skin probes placed 2.5cm from TCM's may detect falsely elevated temperatures and because of this could cause a decrease in incubator heater output, resulting in an underheated infant.

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THE USEFULNESS OF THE INDIRECT COOMB'S TEST (ABO TEST) IN PREDICTING HYPERBILIRUBINEMIA IN ABO HEMOLYTIC DISEASE OF THE NEWBORN. Peter R. Serrao, Houchang D. Modanlou, Miller Children's Hosp., University of Calif., Irvine.

A positive indirect Coomb's test (ABO test) in the serum of ABO incompatible newborn infants has been advocated to predict the occurrence of hyperbilirubinemia. Transcutaneous bilirubin index (TcBI) and calculated total serum bilirubin (TBS) were determined serially in the first 72 hours of life in 2 groups of ABO set-up infants and a 3rd control group (no ABO set-up) as follows: Group I-positive ABO test (n=63), Group II-negative ABO test (n=31) and Group III-control (n=109). Total serum bilirubin determined in 33 full-term Caucasian newborn infants was correlated with simultaneous TcBI readings yielding an R value of 0.93. The TcBI readings were obtained using a Minolta Jaundice Meter 101. Mean BW and GA for the 3 groups were 3464±518, 3589±587 and 3466±514g and 39.5±1.1, 39.8±1.2 and 39.7±1.1 weeks.

		MEAN ± 1 S.D. TOTAL SERUM BILIRUBIN mg%			
		GP I	GP II	GP III	P
0-24 hrs	(n)	3.31±1.71 (55)	2.85±1.80 (26)	3.0 ±1.68 (93)	NS
25-48 hrs	(n)	6.23±2.84 (59)	4.66±2.64 (24)	6.03±2.57 (91)	NS
48 + hrs	(n)	7.39±3.50 (39)	6.06±3.94 (17)	6.96±4.19 (46)	NS

Determination of TBS using TcBI still did not show any statistically significant differences when Groups I, II and III were compared. These results reveal that a positive ABO test does not increase the predictive value of hyperbilirubinemia in ABO incompatible infants. Furthermore, in Caucasian newborn infants TBS determination can be substituted with TcBI during the first three days of life.

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³H-BILIRUBIN UPTAKE IN NEUROBLASTOMA CELLS (N115). Misbah Shah, David Schiff, George Chan, Mark Poznansky. University of Alberta, Department of Pediatrics and Physiology, Edmonton, Alberta, Canada.

In spite of an understanding of the biochemistry of bilirubin and the clinical picture associated with hyperbilirubinemia, no studies have defined the target of bilirubin at the cellular level. To determine this, ³H-bilirubin is prepared biosynthetically in the rat by injection of ³H-δ aminolevulinic acid. ³H-bilirubin extracted from the pooled bile of 6 rats had specific activity of 3.6 X 10⁶cpm/mMol. The N115 cells seeded at a concentration of 10⁵ cells in 2 cm tissue culture dishes are adapted to grow in a protein free media. To determine the effect of time and temperature on ³H-bilirubin uptake, 0.2μCi/24nM of ³H-bilirubin was added to the media at bilirubin-albumin molar ratio (B/A) of 0-1.5 and incubated from 0 min to 24 hrs at 37°C, 24°C and 4°C. The amount of bilirubin uptake plateaus at 3hrs, is affected by the concentration of albumin, but is not sharply temperature dependent. The bilirubin uptake at 3hrs in the absence of albumin was 89.3cpm/μg DNA, decreased to 42.5cpm/μg DNA at B/A of 2.5 and to 31.2cpm/μg DNA for a B/A of 0.8. To determine the effect of bilirubin concentration on uptake, ³H-bilirubin ranging from 0.005μCi to 0.040μCi were added to the media and incubated for 3 hrs at 37°C in the absence of albumin. Uptake is linearly related to the concentration of ³H-bilirubin added. The results show ³H-bilirubin uptake peaks by 3hrs, is concentration dependent and there is no sharp temperature dependence. Although the uptake mechanism has not been determined, it is limited by the amount of albumin present, and is probably a passive process.