

1345

RISK OF RESPIRATORY DISTRESS SYNDROME (RDS) FROM VERY LATEST SAMPLING FOR LUNG PHOSPHOLIPID PROFILE (LPP) BEFORE OR AT BIRTH AMONG INFANTS WITH MATERNAL PROM. Bedford W. Bonta, CAPT MC USN & William L. Gill, CAPT MC USN, Ret. (Sponsored by F. Stanley Porter) Naval Hosp., Portsmouth, VA

The very latest amniotic fluid (AF) samples obtained from mothers whose pregnancies were complicated by PROM (67 samples) and gastric aspirates (GA) samples obtained from premature infants admitted to NICU for possible treatment of RDS (166 samples) when indicated were analyzed for surface active phospholipids using two zone, thin-layer liquid chromatography following separation of disaturated phospholipids from saturated, acetone soluble phospholipids to obtain LPPs. Results were obtained during the period 9/79 to 8/84 and compared with clinical and x-ray evidence of RDS among 233 premature infants studied. The following results indicate the risk of RDS vs LPP results to date

COMBINED SAMPLES	LUNG PHOSPHOLIPID PROFILE				
	IMMATURE (28.1)	PREMATURE (30.8)	TRANSITIONAL (32.5)	MATURE(c) (32.6)	MATURE (35.0)
(avg. GA(wk))	(28.1)	(30.8)	(32.5)	(32.6)	(35.0)
+ RDS (%)	5 (100)	25 (96.2)	30 (77)	6 (8.3)	0 (0)
- RDS	0	1	9	66	91
TOTALS	5	26	39	72	91

*signifies L/S > 2.0; ZPI > 15%; but 0% PG. Within these results, it should be noted that transitional LPPs from AF samples indicated only a 57.1% risk (8/14) while LPPs from GA indicated an 88% risk (22/25) (p < .05 by 2-way ANOVA) suggesting that the closer the profile is performed to birth, the more accurate. Both AF & GA LPPs showed a linear correlation with maturation and gestational age. The more mature the profile the greater the GA with the exception of 6 infants with mature(c) LPPs who developed RDS. Of the 6, none were class A IDMs. Conclusion: Infants who demonstrate LPPs which are transitional or less mature have a > 85% risk of developing RDS. LPP provides a valuable tool in guiding obstetric and neonatal care of infants at risk for respiratory distress syndrome.

1346

EFFICACY OF DEXAMETHASONE (DXM) IN MANAGEMENT OF PROGRESSIVE BRONCHOPULMONARY DYSPLASIA (BPD). Bedford W. Bonta CAPT MC USN & Lewis Otero CDR MC USN. (Sponsored by F. Stanley Porter) Pediatric Service, Naval Hospital, Portsmouth Virginia.

During the period 1/80 to 9/84, 217 infants have required mechanical ventilation (MV) for respiratory insufficiency of diverse etiology. 17 (7.8%) ventilator-dependent infants with clinical and x-ray evidence of Northway stage II BPD received a rapidly tapered course of DXM (.5 mg/kg IV x 3 days, .3 mg/kg x 2 days, then tapering by 20% doses for total of 10 days). 13/17 (76.5%) "responded"; i.e., required MV < 3 days (mean) and supplemental O2 < 7 days (mean) compared to "non-responders" who required MV > 19 days (mean) (p < .001, 2-way ANOVA) and supplemental O2 > 26 days (mean) (p < .001), summarized in table below:

PARAMETER	DXM "responders"	DXM non-responders	p-value
#	13	4	
GA	36.6 ± 4.1	33.5 ± 5.7	NS
BW	2631.2 ± 999.1	1955.0 ± 1226.4	NS
(PreDXM) hrs / hrs	222.7/237.0	241.3/241.3	NS/NS
(DXM Rx) hrs / hrs	69.5/156.8	461.0/635.5	<.001 / <.001
(Total) hrs / hrs	292.2/393.8	702.3/876.8	<.0001 / <.001
Survival (%)	13/13 (100)	2/4 (50)	<.005

9/11 infants (82%) with persistent pulmonary hypertension (PPHN) responded while 4/6 (67%) infants with RDS responded. Among the non-responders, 2 (50% died) (p < .005). Both infants had RDS complicated by PIE and BPD. Only 1 infant among 15 survivors still requires home oxygen therapy. All 15 infants appear to be developing normally to date. Conclusion: DXM, if administered just prior to clinical and radiographic evidence of Northway stage III BPD, appears to significantly reduce ventilator dependence and improve prognosis in progressive bronchopulmonary dysplasia of the neonate.

1347

CONTINUOUS VERSUS INTERMITTENT HEPARINIZATION OF UMBILICAL ARTERY CATHETERS. Elena M. Bosque and Linda Weaver, (Spon. by June P. Brady). Dept. Peds., Children's Hospital of San Francisco, San Francisco, CA.

Previous studies have compared the rate of occlusion of umbilical artery catheters with and without heparin (Rajani, 1979; David, 1981). However, the difference between continuous infusion versus intermittent flushing with heparin has not been studied. We therefore designed a randomized controlled trial of continuous infusion vs. intermittent flushing in 47 infants who required umbilical artery catheters. Twenty-nine received continuous infusion with heparin (1 U/ml) and 18 received intermittent flushing with heparinized saline (1 U/ml). Ten infants weighed < 1000 g, 19 weighed 1001-1800 g, and 18 weighed > 1800 g. We recorded duration of patency, reason for removal, the number and severity of complications (blanching and cyanosis of legs), and clinical history.

	N	Birth Weight	Occluded	Complic.	Patent
Cont. Heparin	18	1912	195	0	6
Intermit. Heparin	29	1568	156	8†	4

x±SE, †p < 0.02 vs continuous. There were no significant differences in severity of disease, birth wt., birth wt. distribution, number or severity of complications, PT/PTT, size of catheter, glucose concentration, rate of infusion, or drugs. Seventy-six percent of patent catheters remained in place for more than 24 hours (range 8-167 hrs). All of the occlusions occurred in infants who weighed 1800 g. Our findings indicate that continuous heparin infusion is a better way of maintaining patency of an umbilical artery catheter.

† 1348

CAVITARY PERIVENTRICULAR LEUKOMALACIA (PVL): INCIDENCE AND SEQUELAE. Mary E. Bozynski, Michael N. Nelson, Terrence A.S. Matalon, Karen J. O'Donnell, Diane R. Genaze, Celine Rosati-Skertich, Patricia M. Naughton, Ushanalini Vasani, Dept. of Pediatrics, Rush Medical Coll., Rush-Presbyterian St. Luke's Med. Ctr., Chicago. (Spon. by SM Donn).

Recent real-time ultrasonographic studies have shown that the diagnosis of cavitory PVL can be made in vivo. From 1-31-82 to 6-30-84 all infants weighing < 1200 g were screened for intracranial hemorrhage (ICH) using real-time ultrasonography at 1, 2, and 4 weeks postnatal age and at least monthly through term corrected age. PVL was diagnosed in 6/119 survivors. ICH was seen in 45/119 including 4 of 6 infants with PVL. Cavitory lesions of PVL were first diagnosed at 4-6 weeks postnatal age in all. Some lesions were undetectable by 10-12 weeks. Follow-up data is presented below.

Patient	ICH	Bayley		Age*	Sequelae
		MDI	PDI		
1	IVH	< 50	< 50	21	spastic diplegia
2	-	87	50	25	spastic diplegia
3	-	-	-	-	died, 4 mos.
4	IVH	< 50	< 50	8	spastic quadriplegia
5	GMH	< 50	< 50	8	spastic diplegia
6	IVH	-	-	0.5	hypertonicity L > R

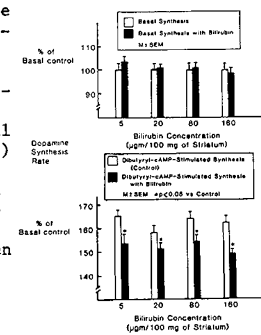
Poor visual attention at term was noted on the Brazelton Neonatal Assessment Scale in all patients.

*Age corrected for prematurity in months. Conclusion: PVL is a marker for cerebral palsy and may occur in the absence of ICH. Careful longitudinal scanning, past the usual time of ICH is mandatory for diagnosis.

1349

IN VITRO EFFECT OF BILIRUBIN ON DOPAMINE SYNTHESIS IN ADULT RAT BRAIN SYNAPTOSOMES. Benjamin S. Brann IV, William J. Cashore, Robert Patrick, and William Oh. Brown Univ, Sect of Neurobiology, Women & Infants Hosp, Dept of Ped, Providence, RI.

Bilirubin (BR) can inhibit cyclic AMP-dependent protein kinase activity. To investigate the mechanism of BR neurotoxicity, we studied the effect of BR on production of dopamine, a neurotransmitter whose synthesis is stimulated by cyclic AMP (c-AMP). We used a synaptosome (SYN) preparation to study dopamine synthesis rate (DSR); in vitro, SYNs, the biochemically functional units of synapses, were isolated by differential centrifugation from the corpus striatum of adult male Sprague-Dawley rats. DSR was quantitated by ¹⁴C, produced after addition of the labeled precursor, L-(1-¹⁴C) tyrosine. The effect of BR was assessed at 4 different BR concentrations under 2 experimental conditions: basal DSR and 2mM dibutyryl c-AMP (db c-AMP) stimulated DSR. Results as noted in figures, were expressed as % of basal DSR and compared against matched controls. We conclude that while BR has no effect on basal DSR, it does dampen the db c-AMP stimulated synthesis of dopamine in vitro. The data provide evidence for an inhibitory effect of BR on protein kinase-mediated neurotransmitter synthesis activation.



1350

THE EFFECT OF BILIRUBIN (BR) ON CEREBRAL CORTEX (CE) O₂ AND GLUCOSE METABOLISM IN FIGLETS (P) Benjamin S. Brann IV, Barbara S. Stonestreet, William Oh, William J. Cashore, Brown Univ, Women & Infants Hosp. Dept. of Ped. Providence, RI

BR inhibits in vitro oxidative phosphorylation and glycolysis. This study investigated the in vivo effect of BR on O₂ consumption (VO₂), O₂ extraction (O₂Ex), glucose consumption (VGlu), and glucose extraction (GluEx) in the CE. Sixteen 2-4 day old P were studied in 3 groups: 1) control (C) 2) control with sulfisoxazole (CS) and 3) experimental (E). CS and E received sulfisoxazole. E was infused with BR for 4 hrs to maintain the serum BR of 13.2 ± 1.8 mg% (M±SEM). CE BR in E was 6.7 ± 8 µg/gm of CE (M±SEM). CE blood flow (microsphere method) and aorta-superior sagittal sinus differences in O₂ content and glucose were measured to calculate VO₂, O₂Ex, VGlu, and GluEx. No changes were noted in VO₂ or O₂Ex. VGlu was increased in CS, but not in E. The mean reduction in arterial glucose of 53.3 mg/dl in all groups (p < 0.05), over the four hours of study, was associated with increased GluEx in CS and C, but not in E. We speculate that BR may alter GluEx, but has no major effect on VO₂ or O₂Ex.

