

**1236** A RELATIONSHIP BETWEEN PaCO<sub>2</sub> AND RETROLENTAL FIBROPLASIA (RLF) Charles R. Bauer and Susan M. Widmayer (Spon. by E. Bancalari) Univ. of Miami, Dept. of Ped. Miami, Florida

Flower, et al. have reported that newborn animals made hypercarbic had both an increased incidence and severity of RLF. This study concerns data on 74 surviving infants with birth weights  $\leq$  1000 grams, half of whom (37 infants) had RLF diagnosed either while in hospital or shortly after discharge. Twenty eight independent variables were analyzed to determine their role in the occurrence of RLF. By discriminant analysis, 9 of these variables correlated with the development of RLF ( $r=.70$ ) and accounted for 49% of the variance. The total function (nos. 1-9) yielded a Chi-square of  $p < .0007$ . This function would correctly predict infants with RLF 84% of the time. The component which best predicted the outcome was the highest PaCO<sub>2</sub> measured in the infant (#1). The second most important variable was the total number of high PaCO<sub>2</sub>'s ( $> 50$  TORR) which occurred simultaneously with an elevated PaO<sub>2</sub> ( $> 100$  TORR). Other variables included the total number of PaO<sub>2</sub>'s  $> 100$  TORR (#3), the Apgar Score at 1 minute (#4), the Ponderal Index (#5), total days on CPAP (#6), the highest recorded PaO<sub>2</sub> (#7), total respirator days (#8) and the Ponderal Index Percentile (#9). These data suggest that PaCO<sub>2</sub> may be a very significant variable in the development of RLF. Retinal vasoconstriction, if viewed as protective, may be abolished by hypercarbia; thereby allowing free flow of potentially toxic hyperoxic blood into the retinal tissues. We suggest that continuous PaCO<sub>2</sub> monitoring may be as important as PaO<sub>2</sub> monitoring in the prevention of RLF.

**1237** POTENTIAL DANGER OF A PLASTIC BODY HOOD VS. BENEFICIAL EFFECTS OF A THIN PLASTIC BLANKET IN SHIELDING INFANTS UNDER RADIANT WARMERS. Stephen Baumgart, William W. Fox, Richard A. Polin. Univ. of Pa. Sch. of Med., Dept. of Peds., Children's Hosp. of Phila., Philadelphia, PA.

Two groups of 5 premature newborns nursed under radiant warmers were studied for two consecutive hours with and without two types of plastic heat shields to determine their effect on (1) servocontrolled radiant warmer power demand (wattmeter), (2) radiant heat received at bed level (thermopile) and (3) insensible water loss (IWL, Potter Scale). One group (1.33 $\pm$ 1.18 mean $\pm$ SEM kg) was studied under a transparent body hood (3 mm thick), the other (1.23 $\pm$ 1.12 kg,  $p=NS$ ) was studied under a thin (.013 mm) plastic blanket. Infants required 42% more power from the servocontrol when nursed under the hood (208 $\pm$ 24 control vs. 297 $\pm$ 35 watts,  $p < .001$ ). In contrast, infants under the blanket demanded 21% less warmer power (214 $\pm$ 11 control vs 169 $\pm$ 10 watts,  $p < .001$ ). Heat received at bed level decreased significantly for infants under both shields: 69% in the hood (13.8 $\pm$ 1.9 control to 4.3 $\pm$ 1.0 mmw/cm<sup>2</sup>,  $p < .001$ ), and 38% under the blanket (14.2 $\pm$ 1.9 control to 8.8 $\pm$ 1.5 mmw/cm<sup>2</sup>,  $p < .001$ ). IWL was significantly less only in infants nursed under the blanket (3.98 $\pm$ 1.03 control vs. 1.46 $\pm$ .56 ml/kg/hr  $p < .02$ ). Skin temps and ambient temp and relative humidity did not change with either type of shield ( $p=NS$ ). This study suggests that a body hood significantly blocks radiant power delivery to infants under radiant warmers without conservation of IWL. These infants may have been cold stressed since their radiant power demand was consistently increased. The plastic blanket interferes with transmission of radiant heat and reduces IWL.

**1238** NEW CONSIDERATIONS FOR SODIUM, GLUCOSE AND VOLUME ADMINISTRATION TO VERY LOW BIRTHWEIGHT (VLBW) INFANTS: A CHALLENGE IN FLUID MANAGEMENT. Stephen Baumgart, Richard Sosulski, William W. Fox, and Richard A. Polin. Univ. of Pa. Sch. of Med. Dept. of Peds., Child. Hosp. of Phila., Phila. PA

Fluid balance in VLBW newborns nursed under radiant warmers was evaluated in 7 premature infants (.720 $\pm$ .40 mean $\pm$ SEM kg). Infants received fluid volumes on days 1, 2 and 3 of life of 75 $\pm$ 9, 109 $\pm$ 9 and 133 $\pm$ 12 ml/kg/day. Sodium intake (mEq/kg/day) was 3.6 $\pm$ 2.5 day 1, 3.75 $\pm$ 1.25 day 2 and 3.75 $\pm$ 1.25 day 3. Glucose infusion rates were 6.4 $\pm$ 1.3, 8.9 $\pm$ 1.7 and 8.6 $\pm$ 1.5 mg/kg/min on days 1, 2 and 3. Infants were weighed (Potter Scale) a total of 11 one hr. periods to determine insensible water loss (IWL). Daily weights serum and urine chemistries and urine volumes were monitored. Mean IWL was 175 $\pm$ 23 ml/kg/day (range 89-379). Infants lost a mean 2.6 $\pm$ 1.1% of body weight per day. Serum sodium increased in 6/7 infants, 2 were  $>160$  mEq/l. Five became hyperglycemic ( $>130$  mg/dl) and all 7 were glucosuric. 3/7 infants' urine Sp Gr were  $>1.015$ . All specimens with Sp Gr  $>1.015$  contained blood, protein or glucose making interpretation difficult. No infant was oliguric ( $<1$  ml/kg/hr for  $>12$  hrs). These data demonstrate much larger IWL in VLBW infants than previously reported. Routine increases in fluid volume did not compensate IWL and standard concentrations of sodium and glucose may have been inappropriate. Daily weights, intake-and-outputs, and Sp Gr may not predict significant dehydration, and once serum glucose rises, osmotic diuresis may mask impending oliguria. Consideration should be given to increasing free water intake and decreasing glucose and sodium concentrations in fluids administered to the VLBW infant.

**1239** PHENCYCLIDINE (PCP) INDUCED ABSTINENCE SYNDROME IN NEWBORN INFANTS. X.D. Bean, R.L. Alexander,\* and J. Kahn-Variba\* (Spon. by R.J. Schlegel), Dept. of Ped., Chas. R. Drew Med. Sch. & UCLA Med. Sch., Los Angeles, California

Twenty-five newborns of admitted PCP abusive mothers were observed for signs of an abstinence syndrome during the first weeks of life. Positive findings included: irritability(25), poor feeding(25), tremors(16), nystagmus(15), hyperreflexia(7), shin abrasions(7), increased appetite(6), abdominal distention(5), diarrhea(3), and diaphoresis(2). Hypertension and tachycardia were not consistent findings. The mean birth weight was 2581 grams(1200-3900). Eight infants were of less than 38 weeks gestation(Dubowitz). Five had APGAR scores  $<5$  at 1 min. with two  $<5$  at 5 min. The mean head circumference was 32 cm(27-35). There were no dysmorphic features. Negative laboratory tests included: "TORCH" screen, cbc, VDRL, electrolytes, thyroid, Ca, Phos, Mg, glucose, CSF, and blood cultures. Despite clinical findings in all infants, urine screens were positive for PCP in only 5 cases suggesting undetectable analogs or low concentrations. One infant's urine was positive for both PCP and heroin. Positive first voided urines were consistent with amniotic presence of PCP at term. Cord blood was positive in one case. Thorazine(0.5mg/kg) q 6 h temporarily reduced tremulousness. Narcan(0.1mg/kg IV) was ineffective. Despite hyperhydration, gastric lavage and urine acidification, symptoms persisted from 3 days to 4 months.

Ingested PCP crosses the human placenta during gestation. It induces an abstinence syndrome consistent with a central nervous system receptor and suggest physical dependency in the newborn.

**1240** LARGE INTRAVENTRICULAR HEMORRHAGE (IVH) AND LABOR IN INFANTS  $>1000$ g. Raul Bejar, Violeta Curbelo, Ronald Coen, Louis Gluck. Univ. of California, San Diego, Dept. of Pediatrics, La Jolla, California.

Seventy-five infants  $<34$  weeks gestation & birthweight  $\geq 1000$ g had ultrasound brain studies to diagnose IVH and subependymal hemorrhages (SEH) on the first day of life (30' to 23 hrs. after birth). They were grouped according to delivery (with & without labor). Diagnosis in the first 24 hours after birth & major IVH/SEH (IVH/SEH associated with ventricular enlargement) were considered.

	LABOR/NO LABOR			LABOR "NORMAL"/NO LABOR-SICK		
N	55	20	P	16	16	P
BWg(x̄)	1336	1398	NS	1462	1352	NS
5' Apgar(x̄)	6.6	7.0	NS	7.9	6.7	NS
Fetal pH*birth	7.31	7.31	NS	7.36	7.30	NS
Outborn	24	11	NS	4	10	$<.05$
Male	38	15	NS	12	12	NS
Corticosteroids	2	2	NS	1	2	NS
Major IVH/SEH	11	0	$<.05$	4	0	$<.05$

\*25 infants (labor), 6 infants (no labor)  
 Infants born after labor had a higher incidence of major IVH/SEH even if those without RDS, PDA and asphyxia born with labor were compared with sick infants born without labor (2 Rh-hydrops, 14 RDS & PDA, 2 severe asphyxia). Labor seems important in the pathogenesis of large IVH/SEH in infants BW $\geq 1000$ g.

**1241** EARLY PDA TREATMENT WITH INDOMETHACIN (INDO) & INTRAVENTRICULAR HEMORRHAGE (IVH). Raul Bejar, Lorenzo Osorno, Violeta Curbelo, Howard Schneider, Ronald Coen, Louis Gluck. Univ. of Calif., San Diego, Dept. of Ped. La Jolla, CA

Thirty sick infants (BW $\geq 1200$ g) without IVH or subependymal hemorrhage (SEH) or with minor IVH/SEH (without ventricular dilatation) on the 1st day of life had frequent ultrasound studies during the 1st week to detect changes in IVH/SEH. Eleven infants with RDS & PDA were treated with Indo before 96 hrs. of life. These treated infants were compared with 19 sick infants who did not receive Indo.

	Early Indo	No Indo	P
N	11	19	-
BW(g) x̄ $\pm$ 1SD	1492 $\pm$ 173	1440 $\pm$ 190	NS
GA(wk) x̄ $\pm$ 1SD	30 $\pm$ 1.4	31 $\pm$ 1.0	NS
5' Apgar x̄ $\pm$ 1 SD	7.0 $\pm$ 2.1	6.2 $\pm$ 2.5	NS
Aortograms	5	1	$<.01$
Labor (No.)	5	13	NS
† IVH/SEH	2	1	NS

There was no difference in proportion of infants who increased IVH/SEH size in treated & untreated groups. Early Indo treatment of PDA does not seem to increase the incidence of major IVH/SEH in sick infants with BW  $\geq 1200$  g.