**†1296** INTRAUTERINE DISTRESS IMPAIRS LACTOSE ABSORPTION IN THE FULL TERM INFANT. Stuart Berezin, Anita Bhole, Leonard J. Newman. (Spon. by L.Shapiro) New York Medical College, Westchester County Medical Center, Department of Pediatrics, Valhalla, New York.

Meconium staining of the amniotic fluid or fetus is considered to be indicative of fetal distress. Although many infants with meconium stained amniotic fluid exhibit no signs of depression, some brief period of asphyxia may have induced passage of meconium prior to delivery. This study was designed to determine if passage of meconium in utero is associated with increased lactose malabsorption. Eighteen full term infants were studied for lactose malabsorption by breath hydrogen ($H_2$) testing. Breath $H_2$ samples were obtained through a nasopharyngeal catheter after a formula feeding. Samples were obtained preprandially and then 30, 60, 90, 150, and 180 minutes postprandially. The samples were obtained at 7 days of age to insure colonic bacterial colonization. Seven of the 18 infants were meconium stained at birth. The Apgar scores and the clinical courses of the two groups were similar. Meconium stained infants showed significantly increased breath $H_2$ production. Mean breath $H_2$ production level in the meconium stained infants was 24.14 ppm compared to 4.02 ppm in the non-meconium stained infants. Intrauterine asphyxia may impair mesenteric blood flow leading to intestinal mucosal damage and increased lactose malabsorption.

**1297** DISTRIBUTION OF PULMONARY BLOOD FLOW AND PROTEIN LEAK IN PREMATURE LAMBS. David Berry, A.H. Jobe, H.C. Jacobs, M. Ikegami, UCLA School of Medicine, Harbor-UCLA Medical Center, Dept. of Pediatrics, Torrance, CA

We studied 10 premature lambs with RDS to assess pulmonary blood flow (PBF) and protein leak distribution relative to aerated and atelectatic lung volumes. The lambs were delivered by C-section, intubated, paralyzed and ventilated so as to maintain normal blood gases. At 3.5 hrs, $^{125}I$ ovalbumin (OA) was injected into an umbilical artery. At 4 hrs, radiolabeled microspheres were injected into the right ventricle to assess PBF distribution. The animals were sacrificed at 4 hrs of age, the lungs were removed, and divided into approximately 60 1 gm pieces, separating the lung into 3 categories: collapsed (C), partially aerated (P), and fully aerated (A). Each piece was assayed for $^{125}I$ and microspheres. Results: 1) There was more flow to A than C regions, $p<.01$ in 8/10 lambs. By weight A was 36.7-70.1% (56.1%) and C was 14.9-52.1 (26.4%), while the % of total blood flow was 49.6-77.7% (64.0%) and 8.0-39.1% (19.2%), respectively. Without autoregulation there would be a mean shunt of 26.4% instead of the 19.2% measured, which could make a significant difference in the $FiO_2$ needed to maintain normal oxygenation. Including P with C does not significantly change these results. 2) There was a relatively uniform protein leak throughout the lung but more in A than C in 4/5 animals that received OA, $p<.05$. 3) There was no correlation between blood flow and protein leak. Conclusions: Premature lambs with RDS have a small but significant ability for autoregulation of PBF, and intravascular protein tends to leak more in A than C regions.

**1298** PERSISTENT PNEUMOTHORAX (PTX). DIAGNOSIS AND IMPLICATIONS. Jatinder Bhatia and Oommen P. Mathew[1] (Spon. by David K. Rassin), University of Texas Medical Branch, Dept. of Pediatrics, Galveston, Texas.

The time-course of resolution of PTX in neonates is not known. We evaluated infants developing PTX, both prospectively (6 mo.) and retrospectively (18 mo.) to determine the time of resolution of PTX. Incidence of PTX was 7.6% (65/851 admissions). Fifty infants required tube thoracostomy. Ten infants who died within 24 hours of tube thoracostomy without resolution of PTX were excluded from further analysis. Fifty-four PTX in 40 infants (27 premature, 13 term) form the basis of this report. Thirty-one infants required mechanical ventilation. Majority (87.5%) of the infants developed PTX within 72 hours of birth. Twenty-eight 50 and 83% of PTX resolved (absence of pleural air on radiograph and cessation of bubbling through underwater seal) within 24, 96 and 168 hours of tube thoracostomy, respectively. Only 17% PTX persisted beyond 168 hrs; all in mechanically ventilated infants. In infants with PTX unresolved by 168 hours (7 infants) there were a greater number of preterm than term infants (5 vs 2). A significantly ($p<0.05$) greater number of preterm infants with persistent PTX developed chronic lung disease (requirement for supplemental oxygen and/or ventilatory assistance for $\geq$28 d) than infants with PTX resolved by 168 hrs. We suggest that PTX unresolved by 168 hrs of tube thoracostomy be defined as persistent and intervention be considered, especially in preterm infants, since chronic lung disease is associated with its persistence.

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**1299** EVALUATION OF NEONATAL HYPERCOAGULABILITY AND ROUTINE HEPARINIZED INFUSIONS. Vinod K. Bhutani, Soraya Abbasi, Mary Grous & Lois Johnson. Univ. of Pennsylvania Sch. of Med., Pennsylvania Hospital, Sect. Newborn Pediatrics, Philadelphia.

Unmonitored use of heparinized parenteral solutions with the altered heparin metabolism, indwelling catheters and paradoxical hypercoagulable status of newborns is of particular concern. Neoates (n = 164) with birthweight (BW) from 500 to 3500 gms were studied. Only central intravascular solutions were heparinized (100 units/100 ml). Coagulability (Co) was determined as the slope (units/sec) of thrombin generation curve (Sonoclot ); The daily dose of H and plasma H level (0.1 unit/ml $\cong$ a PTT of 60 secs) and Co were measured. Serial mean daily values of Co for each group (SD ± 18%) are:

| Group: | BW (kg) | n. | 1 | 2 | 3 | 4 | 5 | 6 | 7 days |
|---|---|---|---|---|---|---|---|---|---|
| I | 0.5 - 0.75 | (12) | 19 | 30 | 32 | 25 | 21 | 27 | 23 |
| II | 0.75 - 1.00 | (38) | 39 | 35 | 34 | 40 | 33 | 33 | 30 |
| III | 1.00 - 1.25 | (34) | 49 | 35 | 45 | 28 | 29 | 28 | 28 |
| IV | 1.25 - 1.50 | (32) | 21 | 40 | 34 | 29 | 33 | 28 | 28 |
| V | 1.50 - 2.00 | (36) | 25 | 33 | 42 | 34 | 32 | 27 | 41 |
| VI | > 2.00 | (44) | 11 | 32 | 32 | 28 | 31 | 36 | 27 |

The ranges of mean H level (units/ml) and dose (units/kg) for each group are; I: 0.03 - 0.11; dose: 4.4 - 6.6. II: 0.027 - 0.053; dose: 4.3 - 6.7. III. 0 - 0.05; dose: 1.4 - 5.5. IV: 0 - 0.05; 1 - 5.0. V: 0.02 - 0.06; dose: 2 - 5.0. VI: 0.02 - 0.06; dose: 1 - 5.0. These data confirm a continuing hypercoaguable status. Normal values of Co (20 - 25) were only achieved in Gr I and relate to the higher H dosage and higher H level (0.1). To provide a less coagulable status Co levels are used to adjust both dosage/kg and the H level.

**†1300** AN EXPERIMENTAL PRETERM MODEL OF EXTRAUTERINE DEVELOPMENT. Vinod K. Bhutani, Marla R. Wolfson, Nghia N. Tran, S. David Rubenstein & Thomas H. Shaffer (Spon. by William W. Fox), Temple University School of Medicine, Dept. of Physiology & Pediatrics, University of Pennsylvania School of Medicine, Pennsylvania Hospital, Dept. of Pediatrics, Philadelphia.

Liquid ventilation (LV) with oxygenated fluorocarbon (RIMAR 101$^R$) was utilized to develop an extrauterine preterm lamb model. Fifteen preterm lambs ranging in age from 106 to 142 days gestation (0.70 to 0.95 gestation) were studied. At elective cesarean section, the fetal carotid artery, jugular vein and trachea were cannulated. The umbilical cord was clamped and the lamb was liquid ventilated through the tracheostomy. Controlled LV was delivered over 2 hrs at an FRC = 30 ml/kg; tidal volume = 15 ml/kg; frequency = 5-9 brth/min. Normothermia was maintained by radiant (heat lamp) and convective (warmed liquid fluorocarbon) heat exchange. Dextrose (6 mg/kg/min) and bicarbonate (1 mEq/kg/hr) were continuously infused. Hemodynamic parameters during LV ranged from: heart rate = 146-202 b/min; mean arterial pressure = 40-80 mmHg; central venous pressure = 0.7-9.8 mm/Hg; $0_2$ consumption = 1.38-11.8 ml/min/kg. Stable gas exchange was demonstrated with; $PaO_2$ = 158-222 mmHg; $PaCO_2$ = 34-38 mmHg; and pH = 7.28-7.39. The extrauterine model provides general accessibility of the preterm animal thus enabling the necessary instrumentation for comprehensive evaluation. Of further importance, the viability of preterm animals is extended to an earlier gestational age, thereby enlarging the scope of developmental research. (Supported by NIH Grant HL22843 and 5T32HL0741405)

**†1301** THE EFFECT OF HYPERVENTILATION ON TOTAL CALCIUM, IONIZED CALCIUM AND SERUM PHOSPHORUS IN NEONATES. E. M. Bifano, J. Watchko and W. H. Bergstrom, Dept. of Pediatrics, SUNY, Upstate Medical Center, Syracuse, NY.

The management of infants with persistent pulmonary hypertension (PPH) includes hyperventilation induced alkalosis; pH is generally >7.55. The effect of this degree of alkalosis on calcium(Ca), ionized calcium (Ca++), and serum phosphorus(P) was studied in seven neonates with PPHN before, during and after hyperventilation. The results were: Values are mean ± S.E.

| | Control(n=7) | 24 hrs(n=7) | *Recovery(n=5) |
|---|---|---|---|
| pH | 7.39±.01 * | 7.59±.03** | 7.42±.01 |
| PaCO2 | 35±1.5 * | 17±2.0 ** | 35±1.2 |
| Ca Total(mg/dl) | 8.8±.2 * | 7.2±.08 ** | 8.5±.3 |
| ionized(mg/dl) | 3.7±.05 * | 2.6±.06 ** | 3.5±.07 |
| ionized/total (%) | 44±.8 * | 34±.08 ** | 41±.2 |
| P (mg/dl) | 5.2±.11 * | 2.8±.19 ** | 5.4±.5 |

$P<.01$, *vs cont., **vs recovery

There was a negative correlation between plasma Ca++ and pH such that an increase in blood pH of 0.1 units would led to a decrease in Ca++ of .42 mg/dl ($y=-4.2X + 34$; $r=.60$). The changes in serum Ca and P could not be accounted for by urinary losses. Two infants had sustained ionized calcium concentrations less than 2.5 mg/dl during hyperventilation.

In infants with PPHN, hyperventilation is associated with disturbing changes in Ca, Ca++, and P which could have potentially detrimental effects on these critically ill neonates.