

1039 AN EVALUATION OF A NEONATAL TRANSPORT SYSTEM, Frederick H. Wirth, Lawrence R. Wellman, Carol A. Millhouse, Spon. by F. Stanley Porter, Dept. of Ped. Eastern Virginia Medical School, Children's Hospital of The King's Daughters, Norfolk, Virginia.

Pediatricians from 13 hospitals in Eastern Virginia implemented a neonatal ground transport system for high-risk neonates to an Intensive Care Nursery (ICN). In the first 10 months, 254 newborns were transported. 25% were intubated, 22% were on the ventilator, and 3% received classical CPAP.

The efficacy and safety of the transport system were evaluated by comparing clinical parameters obtained on the infant prior to transport and on admission to the ICN. Prior to transport 47% of newborns had axillary temperatures of <36.5 C., 26% had blood pressures <40 mmHg and 36% had dextrostixs of <40 mg%. On admission to the ICN only 7% of the newborns were hypothermic, 16% were hypotensive, and 6% were hypoglycemic. Considering all 3 parameters 66% of the patients improved during transport, 7% deteriorated, and 27% had no change.

Newborns transported by a conventional ambulance prior to the development of the neonatal transport system had a significantly higher mortality during transport and 24 hours after admission (P <.01). The mortality of transported infants within 24 hours of admission was significantly lower than the expected mortality based on birth weight and gestational age as reported by Lubchenco, L.O. et al (J. Ped. 81:4, 1972).

These data demonstrate that a transport system maintained by the ICN will reduce mortality and improve the clinical condition of critically ill neonates transported.

1040 EFFECT OF VARIATION OF LINE VOLTAGE OF PHOTOTHERAPY LAMPS ON BILIRUBIN DEGRADATION IN VITRO AND IN VIVO. Paul Y.K. Wu, Maureen E. Sims, Constance A. Geferman. Univ. of So. Calif. Sch. of Med., LAC-USC Medical Center, Dept. of Pediatrics, Los Angeles.

Previously we reported that irradiance from phototherapy lamps vary linearly with change in line voltage (Ped. Res. 9:373, 1975). The effect of this variation of line voltage on bilirubin photo-oxidation in vitro was studied by observing the rate of bilirubin degradation in test tubes containing bilirubin in concentrations of 20 and 10 mg/100 ml standard solution (Hyland), placed 45 cm below an Air Shield Phototherapy Unit with daylight fluorescent lamps. Line voltage to the unit was controlled by a Variac Autotransformer W20MT 3A and varied to provide 110, 115, 120 and 125 volts. The rate of bilirubin degradation was found to vary linearly with line voltage - t_{1/2} of bilirubin at 1, 2, 3 and 4 hours varied linearly with line voltage. Effect of variation of line voltage on bilirubin degradation was also studied in vivo in 7 infants who required phototherapy for clinical reasons. The line voltage to phototherapy unit was alternated at 110 and 125 volts at 24 hour intervals. Fall in serum bilirubin after 24 hours of phototherapy was found to be 13% and 31% for line voltage of 110 and 125 volts, respectively. Since line voltage varies from place to place and at different times from the same outlet, the irradiance from phototherapy units will also vary depending upon variations in line voltage. These data underscore the need to define line voltage in photoradiation studies.

1041 PLACENTAL TRANSFUSION IN THE NATURALLY BORN LAMBS. Alice C. Yao, Therese Lu, Roger Castellanos, and Bartol P. Matanic, S.U.N.Y., Downstate Medical Center Depts. of Ped., Obs.-Gyn. and Lab. Animal Sci., Brooklyn, N.Y.

The degree of placental transfusion in the unassisted naturally born lambs (NB) was investigated and compared with both early (EC) and late cord clamped (LC) lambs delivered by cesarean section. Blood volume was measured in 22 full-term lambs at ages 40 min to 12 hrs using the double label dilution technique (PIHSA-125 plasma tag and radiochromium-51 red cell tag). The lambs were of 137-148 days gestation and weighed 2500-5500 g. The umbilical cords of the 9 NB lambs were severed by the mothers either by chewing it within a minute or standing up immediately after delivery which allowed the weights of the lambs to stretch and break the cords. The cords were clamped 10 sec after birth in the 8 EC lambs and after 3-5 min in 5 LC lambs. Blood and plasma volumes showed no significant differences amongst the 3 groups probably due to the varying degrees of plasma extravasation during the first hours of life. Mean red cell volume (± S.E.) was 36.7 ± 2.1 ml/kg in the NB group which was significantly greater than the 29.8 ± 2.0 ml/kg of the EC group, p <.05; but smaller than that of LC group, 50.4 ± 2.3 ml/kg, p <.005. These findings indicated that a partial placental transfusion (about 20% more than EC group) occurred in the naturally born lambs, rather than a more complete one as in the LC group.

1042 CLUSTER OF CASES OF NECROTIZING ENTEROCOLITIS (NEC) ASSOCIATED WITH E. COLI 085. Anne S. Yeager, Mary B. McNabb, Drew W. Sullivan, John D. Johnson and Philip Sunshine. Stanford University School of Medicine, Department of Pediatrics, Stanford, California.

During a 4 day period, 3 premature infants developed NEC. All had abdominal distention, guaiac + stools, intolerance of feedings, apnea and pneumatois intestinalis. One developed a perforation of the small bowel. A pure culture of E. coli resistant to all common antibiotics except chloramphenicol and gentamicin was obtained from the peritoneal cavity of that infant. Using media containing 20 µg/ml of kanamycin, stools of all infants in the nursery were screened for this organism. Seven infants, including the 3 with NEC were found to have a kanamycin resistant E. coli and 14 did not. All 7 of the E. coli strains isolated were slow lactose fermenters, had similar antibiograms and were serotype 085. Of the 7 colonized infants, 3 had NEC as described above. Three others had guaiac + stools, intolerance of feedings and abdominal distention without pneumatois intestinalis. Of the 14 infants who were not colonized with the implicated strain, none developed enterocolitis during a 4 week followup. All infants had received ampicillin and kanamycin prior to screening. A strain of E. coli, an organism often considered normal flora, may have contributed to a cluster of cases of NEC. Virulence factors, yet to be identified, may account for this association. If such associations between NEC and certain strains of Enterobacteraceae can be proven, secondary cases may be avoided by preventing colonization with such strains.

1043 A NEW MECHANISM FOR LATE DECELERATION OF THE FETAL HEART RATE. Ming-Neng Yeh, Hisayo O. Morishima, Raymond I. Stark, Leonard Indyk, L. Stanley James, Div. of Perinatal Med., Coll. of P & S, Columbia Univ., N. Y.

Late deceleration of the fetal heart rate (FHR) is a sign of severe fetal asphyxia, but is also seen occasionally when the fetus is neither acidotic nor hypoxic. In a search for other possible causes we postulated that with partial occlusion of the umbilical cord during uterine contractions, the low pressure venous flow would be reduced before changes in arterial flow. This would result in the accumulation of fetal blood in the placenta. Release of the partial occlusion after the contraction would be followed by an increase in venous return and bradycardia from parasympathetic stimulation.

Catheters & electrodes were inserted into 12 fetal baboons, mean gestational age 153 days & an occluding device was placed round the intra-abdominal portion of the UV. After 2 hours recovery (fetal pH 7.36 ± 0.004 and SaO₂ 62 ± 2.3%) water was gradually injected into the cuff in a volume previously shown to partially occlude the UV. With partial occlusion, FHR rose from 189 to 203 beats/min. These changes in heart rate were significantly different from control (p <.001). The bradycardia was accompanied by a significant elevation of BP.

These observations provide an alternative explanation for the pattern of late deceleration of the FHR & stress the importance of monitoring the fetal acid-base state for correct interpretation of fetal heart rate patterns.

1044 PREDICTION OF OUTCOME OF MECONIUM ASPIRATION SYNDROME (MAS) BY ROENTGENOGRAMS - T.F. Yeh, M. Baccaro, V. Harris, and R.S. Pildes, Cook County Hosp. Dept. Pediat. Univ. of Ill. Coll. of Medicine, Chicago

Chest x-rays are helpful in confirming the diagnosis of MAS. In this study, x-rays were evaluated as potential prognosticating tools for predicting the outcome. Eighty infants were studied retrospectively. Initial (0-12hrs) x-ray findings were tabulated without knowledge of clinical outcome. Twenty-five infants needed assisted ventilation; 14 died. X-ray findings were associated with: infiltration in 62 infants, hyperinflation 37, air leaks 25, cardiomegaly 17, segmental or lobar consolidation or atelectasis (C/A) 44. Respiratory failure and mortality were significantly higher (p <.001) in infants who had C/A than in those who showed other x-ray findings (23/44vs2/36; 13/44vs1/36). Pneumothorax was also associated with a higher (p <.05) incidence of respiratory failure but was not related to outcome. Although infants who had C/A had similar gestational age and Apgar score compared to those without C/A, they showed significant differences in initial RDS score (5.3±0.3vs3.9±0.3) and blood gases (Mean±S.E.).

| GROUP | F ₁ O ₂ | pH | pCO ₂ (mmHg) | pO ₂ (mmHg) | A-aDO ₂ (mmHg) |
|---------|-------------------------------|------------|----------------------------|---------------------------|------------------------------|
| C/A | 0.58±0.04 | 7.24±0.02* | 39±3* | 65±6* | 568±7* |
| Non C/A | 0.50±0.03 | 7.31±0.02 | 31±2 | 85±8 | 437±24 *p<.01 |

From this study, it appears that the initial chest film is of value in predicting outcome and that MAS may be divided into two groups; those associated with C/A having a worse prognosis than those without C/A.