

1450 EVALUATION OF CONTINUOUS PaO₂ MONITORS IN THE CARE OF SICK NEWBORNS. VASUNDHARA TAMASKAR*, RAMA SINGH AND MANOHAR RATHI (SPONSOR: D. VIDYASAGAR) Perinatal Medicine, Christ Hospital, Oak Lawn, Illinois

Continuous monitoring of vital signs, e.g. temperature, blood pressure, heart and respiration rates, and ECG, for the care of critically sick infants has become an established hospital routine. We have compared various non-invasive and invasive continuous PaO₂ monitors with arterial blood PaO₂ levels and find that there is a considerable correlation between the values obtained by different procedures. Continuous monitoring procedures permit better evaluation of the patient than skin color, ECG monitoring or clinical observation. Its immediate availability at bedside and the capacity to detect irregularity in oxygen supply is of major clinical advantage. These devices help in preventing the effects of hyperoxemia and hypoxemia. Stabilization of sick infants can be achieved rapidly without repeated arterial blood sampling for PaO₂ determinations. The results suggest that these continuous PaO₂ monitors (invasive or non-invasive) may be able to eliminate or minimize conditions like bronchopulmonary dysplasia, retrolental fibroplasia and brain damage due to lack of oxygen during neonatal development.

1451 INTRAUTERINE FETAL RESUSCITATION WITH TERBUTALINE Nergesh A. Tejani, Uma L. Verma, Syamali Chatterjee. Spon. by Platon J. Collipp. Nassau Cty Med Ctr, Hlth Sci Ctr, SUNY at Stony Brook, Dept. of Ob/Gyn, East Meadow, NY

Cases of intrapartum fetal distress from any cause sustain further hypoxia during uterine contractions due to the concomitant reduction in uterine blood flow during uterine activity. Therapeutic reduction of uterine activity should, therefore, result in recovery of fetal heart rate (FHR) and fetal acidosis, and the birth of a neonate in a better state of oxygenation and acid-base balance. Towards this, terbutaline 250 µg subcutaneously was injected in patients with evidence of fetal distress. All 11 patients showed ominous FHR changes. In 2 of these, fetal scalp blood pH (FSB-pH) was not technically possible. In 2, the FSB-pH was > 7.25. The remaining 7 patients showed FSB-pH ≤ 7.25.

Results: Where adequate FHR trace was available, 9/10 patients showed marked reduction to cessation of uterine activity, and complete or partial recovery of ominous FHR changes. FSB-pH was compared to the mid-point of the umbilical vein and artery pH's. In the 2 cases where the original FSB-pH was > 7.25, no change was seen. However, in cases with FSB-pH ≤ 7.25, a significant improvement from a mean of 7.180 ± .038 to 7.270 ± .066 (P = <.005) was seen. No major side effects were noted.

It is concluded that in addition to conventional management of fetal distress, tocolysis with terbutaline can improve the status of a distressed fetus and result in the birth of a healthy neonate.

1452 SURFACE TENSION (ST) OF AMNIOTIC FLUID (AF) LIPID EXTRACT (LIP. EXT.) AS A PREDICTOR OF IMMEDIATE NEONATAL COURSE. Chandra M. Tiwary, Richard D. Landes, James B. Haddock, and D. Burgess (Spon. by James W. Bass); Department of Peds and Obs/Gyn, Walter Reed Army Medical Center, Washington, DC and Uniformed Services U of the Health Sciences, Bethesda, MD.

ST of AP lip. ext. measures fetal pulmonary maturity. A high ST of AF collected ≤ 24 hrs prior to delivery appears to us to be a nonspecific marker of high risk newborn. AF lipid extracted by chloroform methanol mixture was added to water until maximal decrease of surface tension was reached. The sum of microliters of extract and dynes/cm of surface tension reduction was expressed as an ST "sum". The ST sum was correlated with clinical progress of the baby.

We studied AF from 59 mothers. Twenty of the 59 babies had a complications(s) (hypoglycemia 6, neonium staining 5, Rh disease 4, ABO incompatibility 3, multiple congenital abnormalities 1, RDS). ST sum # Babies Normal Babies with Birth Wt(gm) Gestation(wk) Complications <2500 ≥2500 <37 >37

ST sum	# Babies	Normal Babies	Babies with Complications	Birth Wt(gm) <2500	Birth Wt(gm) ≥2500	Gestation(wk) <37	Gestation(wk) >37
<40	29	24	5	2	27	2	25
>40	30	15	15	5	25	7	25

ST sum of >40 was found in 75% of babies with complications. Low gestation age (<37 wks) identifies 40% and low birth wt. (<2500 gm) only 15% of the 20 babies with complications. The predictive value (for complications) of the ST sum is significantly greater than that of using low gestation age (p <.02) or of low birth wt (p <.01) as a criterion. **Conclusion:** ST sum of >40 suggests an abnormal course in immediate neonatal period requiring close observation.

1453 COMPARISON OF INTRAVENOUS AND INTRAMUSCULAR ADMINISTRATION OF GENTAMICIN IN NEONATES. Elizabeth Chow-Tung, Leonardo Malalis, Alan Lau, Ernest Gurwich, Dharmapuri Vidyasagar, University of Illinois, Dept. of Pediatrics, Chicago

Intravenous (IV) genta is widely used in neonates, however a constant IV site may be difficult in prematures. We compared the pharmacokinetic profile of genta after IV and IM therapy in 16 neonates during the first wk of life. Genta was given (2.5 mg/kg/12 hr) IV as an infusion over 5 minutes on study days 1 & 2, then IM on days 3 & 4. In Group I, serum samples were obtained by heel-stick 2,4,7, and 12 hours after genta was given IV on day 2 (4th dose) and after IM on day 4 (8th dose). In Group II, serum samples were obtained prior to and 20, 40, 60 and 120 minutes after IV and IM genta administration on day 2 and 4 respectively. Serum creatinine were also determined. All samples were frozen until analyzed by enzyme immunoassay (*EMIT system-Syva Corp.). Mean serum concentration obtained for both IV and IM routes in Group I and II were similar (p>0.05). Peak serum concentrations were attained at approximately 20-40' after IM administration for most patients and at or prior to 20' for IV administration. t-test for mean serum concentrations at 120' between Group I and II for both IV and IM administration revealed no significant difference (p>0.05). This suggests that the combined serum concentration profiles generated in Group I and II could reflect actual serum concentrations of individual patients throughout the entire dosing period. IM administration of genta offers rapid drug absorption in neonates and provides serum drug concentration comparable to IV administration. Therefore, IM administration of genta can be a reasonable alternative to IV administration.

1454 A PATHOLOGIC REAPPRAISAL OF KERNICTERUS. Susan B. Turkel, Marta E. Guttenberg, Carole A. Miller, Diane R. Moynes, Joan E. Hodgman. University of Southern California School of Medicine, LAC-USC Medical Center, Department of Pathology and Pediatrics, Los Angeles

Kernicterus, or bilirubin staining of specific nuclei of the brain in newborns, is traditionally considered to represent a deleterious manifestation of hyperbilirubinemia. All infants (32) from January, 1970 through January, 1977 found at autopsy to have characteristic gross bilirubin staining were identified. They were matched with 32 other infants without gross staining for gestational age, weight, length of survival and year of birth. In our initial clinical review we found no differences when multiple factors thought to potentiate risk for kernicterus were compared between the matched pairs. The neuropathologic changes in these two groups were evaluated without knowledge of the clinical or gross findings. While the pattern of gross bilirubin staining followed that classically described for kernicterus, specific histologic changes were found in only two kernicteric and one non-kernicteric infant. The nonspecific finding of diffuse spongy change was more common in the grossly stained brains (p<0.05), but other histologic findings did not differ significantly between the two groups. In the current population of newborns the majority of bilirubin staining in the brain at autopsy may be secondary to prior nonspecific damage, rather than an indication of bilirubin toxicity. Our results emphasize that this yellow staining as seen today, while grossly indistinguishable, is not equivalent to the classical kernicterus of previous years.

1455 TRANSCUTANEOUS BILIRUBINOMETRY IN BLACK & HISPANIC INFANTS. Kamtorn Vangyanichyakorn, Shyan Sun, Azzam Abubaker, Barbara Glista. (Spon. by Franklin Behrle) CMDNJ-New Jersey Med. School, Dept. Neonatology, Newark, N.J.

In an effort to reduce the number of blood sampling, trauma, blood loss due to invasive procedures for serum bilirubin determination, Yamanouchi & Minolta Co. developed a transcutaneous device for measuring subcutaneous bilirubin. This small hand held, spectrophotometric, fiberoptic xenon light measures in 1 second the color intensity of the skin & subcutaneous tissue. It gives a numerical index which was shown to correlate well with the total serum bilirubin concentration of Japanese (Yamanouchi) & with white infants (Lucey). We used the same methodology in black & Hispanic term infants to see if skin color will affect the correlation. None received phototherapy. A total of 112 measurements were done on 71 black term infants (Wt. 2510-4000 gm, age 11-207 hrs, Bil. 1.6-17.7mg%) at 4 different sites. The correlation was best at mid-sternum with correlation coefficient r=0.80 p 0.001 & the standard error of estimate 1.83. In 24 Hispanic infants (69 measurements, Wt. 2530-3970 gm, age 20-132 hrs, Bil. 4.6-15.6 mg%), the best site of correlation was mid-sternum with r=0.64, p 0.001 & standard error of estimate 1.84. The correlation was good in black infants but not as good as in Japanese infants (r=0.93). This suggests that dark skin made some difference. The correlation was less than adequate in Hispanic infants, (r=0.64) probably because their skin color varies. Considering the cost of conventional serum bilirubin determination (av. \$54/test) To Bilirubinometry is not only cost effective but also painless & time saving.