

1354 THE RELATIVE EFFICACY OF AN INCUBATOR AND AN OPEN WARMER IN PRODUCING THERMONEUTRALITY IN SMALL PREMATURES. Michael H. LeBlanc (Spon. by Paul H. Perlstein) U. of Cincinnati Coll. of Med Dept. Peds.

Other studies comparing oxygen consumption (VO_2) in open radiant warmers (RW) and convectively heated incubators (I) demonstrated a trend toward lower VO_2 in the I. This study using a larger group of babies documents that the trend represents a significant difference and an RW is less able than an I to produce a neutral thermal environment for premature infants. The VO_2 of 16 babies less than 1500 gm were measured in I and under RW. Both warming systems (WS) were set to maintain skin temp near 36° (skin temp I 36.04 ± 0.03 SE, RW 35.99 ± 0.01 SE, $p = \text{NS}$). The skin temp probe was shielded from IR radiation. Babies had a mean weight of 1340 gm (1000-1490 gm), mean age of 22 d (6-49 d) and mean post conceptual age of 34 wks (29-40 wks) when studied. VO_2 was measured during a period of non-rem sleep on each baby after at least an hour in each of the two WS-order, randomized. There were no significant differences in rectal temp (I $36.9 \pm 1^\circ$, RW $36.9 \pm 1^\circ$), face temp, mean skin temp (weighted average of 9 skin temps), or time since fed. Air temp (I 33.4 ± 0.4 , RW 27.9 ± 0.3 , $p < .001$), foot temp (I 35.2 ± 0.2 , RW 33.6 ± 0.4 , $p < .001$) and humidity (I 75 ± 2 , RW 55 ± 2 , $p < .001$) were lower in the RW. Mean VO_2 (ml/kg/min \pm SE) was 6.84 ± 0.37 for the I and 7.45 ± 0.44 for the RW ($p < .02$ by two tailed t test). The radiant warmer was less able to induce a minimal metabolic rate than the incubator. Thus if thermoneutrality is required in small premature infants, open radiant warmers should not be used.

1355 HYPERTENSIVE RETINOPATHY IN THE NEWBORN M.E. Leder, W.L. Annable, R.M. Kliegman, J.E. Baley and A.A. Fanaroff CWRU, Dept. of Peds. and Ophthalm., Cleveland, Ohio.

Examination of the eye in the newborn has predominantly been utilized to diagnose retinopathy of prematurity (RLF). Although the ocular findings in systemic disease are of great diagnostic significance in adults, they have largely been ignored in the newborn. Recently we have been impressed by the finding of a retinopathy in newborns with severe hypertension (HBP) (mean arterial pressure > 70 mm Hg on at least 3 occasions). The cause of HBP in these infants was presumed to be predominantly renovascular. In adults with HBP the examination of the retina is characterized by acute angiospasm; similar findings were observed in these neonates. Of 21 infants with HBP, 11 who were poorly controlled exhibited typical changes including arteriolar constriction with an increased ratio of venous:arteriolar width. Infants were examined at least 24 hrs after oxygen therapy had been discontinued; thus these changes were not consistent with other diagnoses. Exudates were observed in 2 infants and hemorrhages (splinter or dot/blot) in 4, less frequently than would be expected in adults, perhaps reflecting short duration of disease and integrity of the vasculature in the newborn. Two infants with retinopathy were reexamined after control of HBP; one showed partial and the other complete resolution of eye findings. The 10 infants with normal initial exams were largely those whose HBP was already controlled. In adults the degree of retinopathy relates to morbidity and mortality; to be proven whether this holds true in the neonate.

1356 FOUR METHODS OF EXPRESSING HUMAN MILK. James A. Lemons, Dolly Green, Richard L. Schreiner, Lemuel Moye (Spon. by J. Bergstein). Indiana University School of Medicine, Indiana University Hospitals, Department of Pediatrics, Indianapolis, Indiana.

The feeding of a mother's own milk to her sick or premature infant while hospitalized has become a common practice. A variety of methods for milk collection are available to mothers and include manual expression (M), hand pumps such as Evenflo (EV) or Loyd B (L), and electric pumps such as Egnell (EG). The present study was designed to compare the effectiveness of these four techniques. Six lactating mothers with established milk supply expressed their milk for 10 minutes on alternate breasts with each of the above four methods at a time of usual nursing, resulting in 120 paired milk expressions (240 samples). The volume and creatinocrit (percent fat) of the milk expressed were measured. Using a cross-over design, the pumping techniques were assessed independently of the effects of time of sampling, the sequence of breast expression and the intermother variability. No effect of the pumping methods on creatinocrit was found. However, the EG pump produced significantly more milk than any of the other techniques ($p < .01$). No significant difference in volume was found between the EV, M, or L methods. These data suggest that an electric breast pump (Egnell) may be a preferred method for establishing and maintaining lactation when infant suckling is not practicable.

1357 MATERNAL RISK FACTORS IN VERY LOW BIRTHWEIGHT INFANTS. Abner H. Levkoff, Milton Westphal, Yvonne Michel, M. Clinton Miller. Medical University of S.C. Departments of Pediatrics and Biometry, Charleston, S.C.

Newborns weighing under 1500 gm defy the ministrations of perinatologists and contribute heavily to the nation's high perinatal mortality rate, yet, maternal risk factors for the birth of such infants have not been analyzed separately. To determine whether maternal factors associated with the delivery of very low birthweight infants (VLBW) under 1500 gm are different from those associated with low birthweight infants (LBW) of 1500 to 2500 gm, prenatal data on 11,114 deliveries were evaluated. The sample included 435 VLBW infants. Maternal race, age, height, weight, gravidity, parity, past pregnancy performance and present pregnancy complications were analyzed using chi-square. Factors related to an increased incidence of VLBW but not of LBW infants were: 1) maternal age ≤ 15 years, ≥ 36 years, 2) gravidity over 8, 3) previous abortions, 4) previous fetal deaths, and 5) hypertensive vascular disease/essential hypertension. Race (black) and low prepregnancy weight were not related to VLBW but were associated with an increase in LBW. The finding that low prepregnancy weight is not related to VLBW implies that limited parturient mass is not a factor in supporting a fetus up to 1500 grams. The other positive findings suggest that suboptimal reproductive capacity and preexisting hypertension predispose to the birth of a VLBW rather than an LBW infant. These results contradict the concept of a uniform set of predisposing factors for the birth of all infants weighing ≤ 2500 gm.

1358 BLUE LIGHT (BL) VS. WHITE LIGHT (WL) ON BILIRUBIN PHOTODEGRADATION (PD) IN VITRO. L.D. Lillen, S.Voorra G. Srinivasan, R.S. Pildes, Cook County Hosp., Univ. of Ill., Chgo. Med. Sch. Chgo, Ill.

BL is considered more efficient than WL in bilirubin PD because of the greater energy output at the λ of maximal absorption for bilirubin. However, bilirubin PD using BL and WL with similar irradiance (I) has not been studied. Since PD is dose related to I in vivo, it was hypothesized that BL and WL with similar I should have the same effect on bilirubin PD. Olympic billi-lites were used with 8-20W duro-test vita-lite for WL and 8-20W F20T12/BB for BL. Sealed heparinized microhematocrit tubes with pre-exchange plasma samples were placed under light with I varying from 0.9-10.2 $\mu\text{w}/\text{cm}^2/\text{nm}$ for 4 hrs. I was measured in the range of 425-475 nm using the Olympic billimeter. The pH, albumin, and temp. of the samples under both light sources were similar. The % PD of bilirubin is shown below. The mean I in comparison groups was the same.

	I*	0.9-2	2.1-4	4.1-6	6.1-8	8.1-10.2
WL % PD		28.9 \pm 6.7	37.7 \pm 4.0	40.2 \pm 4.1	43.7 \pm 2.8	45.7 \pm 2.6
(n)		7	18	13	17	20
BL % PD		23.0 \pm 2.2	31.7 \pm 4.4	37.3 \pm 4.2	42.8 \pm 3.7	44.5 \pm 3.5
(n)		8	15	18	16	19
p		<0.04	<0.001	<0.04	NS	NS

This study indicates that WL with similar I as BL is more effective at lower I in bilirubin PD. These findings suggest that wavelengths other than those found in BL also contribute to bilirubin PD.

* $\mu\text{w}/\text{cm}^2/\text{nm}$

1359 ADVERSE EFFECTS OF NARCOTICS ON VERY LOW BIRTH WEIGHT INFANTS. David J. Lloyd & Wheldon T. Houlisby (Spon. by Alexander C. Allen), Dept. of Neonatal Paediatrics Aberdeen Maternity Hospital, Scotland.

Administration of pethidine and other narcotics before delivery to mothers of VLBW infants was found to be significantly associated with a poor fetal outcome. Of 119 infants 500-1499g birthweight delivered in a two year period 78 survived, 18 died in the first 28 days (NND) and 23 died in utero in labour (IUD). 12 NND and 16 IUD received narcotic within 6 hours of delivery or fetal death compared with 28 survivors, $P < 0.05$. A similar relationship was seen between narcotic administration and suboptimal condition at birth measured by Apgar scores, despite giving naloxone. This persisted when those born by Caesarean section were excluded because of anaesthetic depression. (Infants < 750 g were excluded as they were not mechanically ventilated).

Infants 750-1499g	Total	Apgar ≤ 4 @ 1 min.	Apgar ≤ 7 @ 5 min.
No narcotic ≤ 6 hr	52	14	14
Narcotic ≤ 4 hr	27	14 0.05 $P > 0.02$	19 0.01 $P > 0.001$
Narcotic ≤ 6 hr	36	16 N.S.	24 $P < 0.001$
Infants 750-1499g, Vaginal delivery			
No narcotic ≤ 6 hr	29	7	7
Narcotic ≤ 4 hr	24	12 N.S.	17 0.01 $P > 0.001$
Narcotic ≤ 6 hr	31	14 N.S.	21 0.01 $P > 0.001$

These results suggest that when delivery of a VLBW infant is anticipated use of narcotics as analgesics or sedatives to arrest preterm labour should be avoided.