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NEONATAL TRANSPORT IN SUB-ZERO AMBIENT CONDITIONS: CLINICAL THERMAL STABILITY WITH RADIANT WARMER. Andrew J Macnab. (Spon. by Sydney Segal) University of British Columbia, Department of Pediatrics, Vancouver B.C.

11 sick neonates (weighing 1150 - 2280g) have been studied during transport from sub-zero temperatures (0 to -34°C) in a radiant heat source incubator. This unit has been evaluated 'in vitro'; our referral centre provided unique opportunities for clinical observation under extreme conditions. One observer monitored the infant's condition, core, skin and incubator air temperatures (4cm below the hood). Environmental temp. and wind speed were obtained. The radiant heater, in a curved transparent canopy generated heat at peak wave length of 8.7 micron over 180° of the infant's surface, servo-controlled from a skin thermistor.

Core temperature never fell, and rose to normal in all (6) infants who were hypothermic (mean rise >0.5°C/ hour for 3 hours). The greatest fall in skin temperature was <0.75°C (after 10 minutes unavoidable delay at -21°C with the heater control accidentally lowered to 35°C while unloading). Considerable flux in air temperature within the incubator occurred between periods of warmer activity. Once, a broken connection in the servo-control thermistor rendered the heating unit temporarily inoperable.

Radiant heat can provide a stable thermal environment under adverse conditions; but data suggest an emergency manual override of thermistor control is mandatory and that heater controls should 'lock'. Also, the optimum rate of rewarming after hypothermia, and the effects of a marked flux in air temperature must be established for small infants during radiant warming.

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PLASMA PROSTAGLANDIN E AND $F_2\alpha$ IN TERM INFANTS. Manchandia, M.R., Michelakis, A.M., Karna, P., Dolanski, E.A. (Spon. by W.B. Weil, Jr.) Coll. of Human Med., Michigan State University, Depts. of Pharmacology, Medicine and Human Development, East Lansing.

While prostaglandin E (PGE) levels have been measured in term infants, PGE and prostaglandin $F_2\alpha$ have not been serially reported in infants to determine their change with age. The object of this study was to determine PGE and $PGF_2\alpha$ levels in cord blood and again at 3 days of age in term healthy infants. PGE and $PGF_2\alpha$ levels were measured by radioimmunoassay.

	PGE(pg/ml)		$PGF_2\alpha$(pg/ml)	
	CORD	3 DAYS	CORD	3 DAYS
Mean	1432.50	323.66	684.33	256.33
SD	209.42	203.93	165.42	289.33
SE	85.50	77.08	67.53	118.12

In all instances, both prostaglandin E and prostaglandin $F_2\alpha$ fell significantly by 3 days of age ($p < 0.01$ and $p < 0.05$ respectively). All infants were term healthy neonates without evidence of shunting through a patent ductus arteriosus. These levels of PGE are comparable to reported levels for this age.

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LIGHT TOXICITY TO NEWBORN RETINA. Kenneth H. Messner (Spon. by M. J. Maisels). The PA State Univ., The M. S. Hershey Med. Ctr., Div. of Ophthalmology, Hershey, PA. A prior report of the toxic effect of phototherapy on newborn nonhuman primate retina indicated that considerable acute cellular damage occurred to nonprotected eyes when exposed to 400 ft. candles of cool-white light for more than 72 hours. This preliminary report describes the long term recovery of newborn nonhuman primate retina after acute phototherapy exposure. Newborn stump-tailed monkeys (Macaca arctoides) averaging 450 gms. were placed in an incubator exposed to 400 ft. candles of cool-white fluorescent light. Periods of exposure included 24 hrs., 3, 7, and 10 days. Each right eye was occluded with black velour patch material while the left eye was left uncovered. Following the phototherapy exposure, the monkeys were returned to standard cage environments for 10 months before the retinas were processed for electron microscopy. Histologic study revealed that occluded eyes retained normal cytoarchitecture and all exposed retinas demonstrated substantial recovery although rod and cone receptor segments remained abnormal in retinas exposed for 3 or more days even after 10 months recovery. Counts of the rod and cone nuclei in the outer nuclear layer indicated a loss of viable photoreceptor cells in the unprotected eyes compared to patch occluded eyes. This loss duplicates the aging process in mammalian retina and may not be initially detectable except by histologic examination. Thus the effect of acute phototoxicity may be premature aging of the retina (loss of some rod and cone receptors) with clinically detectable results delayed until later in life.

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EARLY-ONSET GROUP B STREPTOCOCCUS (GBS) NEONATAL SEPTICEMIA AND RESPIRATORY DISTRESS SYNDROME (RDS): CHARACTERISTIC FEATURES OF ASSISTED VENTILATION (AV): H. Modanlou, S. Bosu & M. Weller (Spon. by L. Gluck) Neonatology & Radiology, Miller Children's Hospital, Univ. of Calif., Irvine.

Differentiation of early-onset GBS, requiring AV, from RDS, is difficult prior to culture results. Clinical and AV features of 10 neonates with early-onset GBS were compared with those of 12 randomly selected with RDS. Initial chest x-ray in GBS group was interpreted as RDS in 7 of 10 cases. Four of GBS and 4 of RDS group died. Mean birth weights were 1922±670 and 1340±336 g ($p < 0.01$) and mean gestational ages 35.5±3.2 and 30.2±2.5 weeks respectively ($p < 0.005$). Only in 3 of GBS and 1 of RDS group, was rupture of membranes greater than 12 hours. In both groups AV was accomplished with time-cycled, continuous flow respirator. Analysis of FiO_2, pH, PaO_2, $PaCO_2$, BD and Peak Inspiratory Pressure (PIP) determinations was done at 2 hour intervals. FiO_2 requirement was similar in both groups. In GBS group pH tended to be lower (7.26±0.08vs7.31±0.5 but $p > 0.05$). Mean PaO_2 was significantly lower (58±9.5vs65±5.9 Torr, $p < 0.05$), mean $PaCO_2$ was higher (46±4.4vs43±0.8 Torr, $p < 0.05$), mean BD was higher (7.1±2.1vs 4.5±1.0 meq/L, $p < 0.01$) and mean PIP was higher (30±2.8vs27±1.0 cmH_2O $p < 0.01$) in GBS group. This study reveals that neonates with early-onset GBS septicemia compared to those with severe RDS tend to be more acidotic, have lower PaO_2 and higher $PaCO_2$. Contrary to a previous report, neonates with early-onset GBS septicemia and respiratory insufficiency, require significantly higher PIP than those with severe RDS on AV.

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NECROTIZING ENTEROCOLITIS-ENDEMIC VS. EPIDEMIC FORM. Ara S. Moomjian, George J. Peckham, William W. Fox, Gilberto R. Pereira, Dennis A. Schaberg. (Spon. by Jean A. Cortner), Univ. of Pa. Sch. of Med., Dept. of Peds. and The Children's Hosp. of Phila., Div. of Neonatology, Phila., PA.

Necrotizing enterocolitis (NEC) is a disease of undefined etiology affecting premature infants. A number of hypotheses have been suggested for NEC, and clusters of cases have been reported in nurseries. During Dec. 1974 and Jan. 1975, 14 cases of NEC occurred in patients admitted to the infant ICU. In the 12 months prior to this period a total of 11 cases of NEC occurred. Distinguishing features of the epidemic group vs. the endemic group are summarized:

Comparison of	Epidemic	vs. Endemic	P
Mean birthweight	2.00 kg	1.55 kg	NS
Mean 1 min. Apgar	7.0	4.4	<.02
Mean 5 min. Apgar	8.5	6.4	<.02
Mean age at onset	21.4 days	6.5 days	<.02
Mean # days from 1st feed	16.4 days	2.9 days	<.02
Umb. art. catheter	8/14=57.1%	9/11=81.8%	NS
Intubation	7/14=50%	10/11=90.9%	NS
Intestinal Perforation	1/14=7.1%	7/11=63.6%	<.01
Mortality	3/14=21.4%	6/11=54.5%	NS

Results of a stool culture survey showed an association between Klebsiella colonization and illness. In a 2 month period in 1976 a 2nd clustering of NEC occurred with characteristics similar to those described in the epidemic group above. The awareness of an epidemic form of NEC is important in evaluating the effects of therapy and/or prophylaxis of NEC in premature infants.

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ADVERSE EFFECTS OF TRANSPORTATION ON NEONATES AS MEASURED BY PaO_2. Luis Morett, Anantham Harin, Angelo Ferrara. (Spon.by Joseph Dancis)NYU Sch.Med.-Bellevue Hosp. Ctr., Dept. Ped.

13 preterm neonates (selected by availability of same newborn fellow) with mean gestational age 32.3 weeks ± 3.9 (1SD) & mean wgts. 2015.8 gm ± 1427 (1SD) had serial PaO_2 taken via umbilical catheter at various times:0'(stationary) 6.5' (in transit) 21.3' (at end of transit)>30'(at perinatal center). 8 newborns had RDS, 4 transient tachypnea & 1 pneumothorax. Mean FiO_2 was .6±.3(1SD). 44 blood samples were done on '165' blood pH/gas analyzer (Corning). An additional sample of 20 bloods from an NICU population was used to correlate this analyzer with a portable '802' (Biomarine)(r_{18}=.997 P<.001). Blood samples were also corrected for vibration & time lapse. RESULTS:1)Mean PaO_2 was significantly lower than stationary PaO_2(see Fig.1). This may be a function of increased O_2 demand or impaired V/Q. Increasing FiO_2 for long transports should be considered. 2)No significant changes in serial PCO_2 suggesting hypoxemia not a ventilatory problem. 3)Portable PaO_2 analyzer may be a valid indicator of in-transit PaO_2.

FIGURE 1.-MEAN PaO_2 IN MINUTES-SIGNIFICANCE TESTING

	0' N=13	6.5' N=13	21.3' N=10	30' N=8
PaO_2 Torr (Mean)±1SD	74.7±31.9	51.9±17.7	53.64±17.8	103.3±49.9
Paired t- testing	0' 6.5' t_{12}=2.62 p <.025*	21.3' 30' t=3.07 P<.05**	0' 21.3' t_9=2.78 P<.025*	6.5' 30' t_7=3.16 P <.025*

F-Test (4 time periods) F^3_{40}=5.275; P <.005*

*Highly Significant **Significant Difference