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FAT THICKNESS AS A PREDICTOR OF RESPIRATORY DISTRESS SYNDROME IN INFANTS OF DIABETIC MOTHERS. Stephen C. Engelke and Lawrence R. Kuhns, University of Michigan Schools of Medicine, University of Michigan Affiliated Hospitals, Departments of Pediatrics and Radiology, Ann Arbor, Michigan. (Sponsored by George Bacon).

It has been shown that infants of diabetic mothers (IDM) have increased fat thickness (FT) as the sum of measurements adjacent to the 10th rib on AP chest x-ray (Kuhns, 1974), possibly due to hyperinsulinism. Because of the increased incidence of respiratory distress syndrome (RDS) in the IDM (Robert, 1976) and the known antagonism of lecithin synthesis by insulin (Smith, 1975), x-rays were reviewed of 24 newborns admitted over the last 7 years with respiratory distress. Only 34-37 weeks AGA infants of Class A-C diabetic mothers without a history of prolonged rupture of membranes were included. Fat thickness was independently determined and correlated with the x-ray/clinical diagnosis of RDS or wet lung (WL):

	RDS	WL
↑FT >2 S.D.	I 10	II 2
Normal FT	III 3	IV 9

$p < 0.02$

Group	Mean Birth Wt	Mean Gest Age	Umb Art Cath	Length Stay (days)	FT (mm)
I	2.8	35	7	19	7.0
IV	2.8	36	3	6	5.0

It is concluded that increased fat thickness in a 34-37 week AGA-IDM Class A-C is more likely to be associated with RDS requiring UAC placement and prolonged hospitalization.

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LARYNGEAL INDUCED APNEA IN THE CHEMODENERVATED PIGLET S.Allen Fagenholz, John C. Lee, S. Evans Downing (Spon. by Joseph B. Warshaw) Yale School of Medicine, Depts. of Pediatrics and Pathology, New Haven, Conn.

Laryngeal instillation of certain fluids in the piglet elicits reflex apnea, bradycardia, and hypertension. Chemosensitive receptors at the laryngeal entrance have their afferent pathway in the superior laryngeal nerve. Their stimulation may cause asphyxial death often in the newborn, but rarely in the older piglet. We studied the influence of the peripheral arterial chemoreceptors in modulating laryngeal responses in air-breathing pentobarbital-anesthetized newborn (N=9, age 7.0±0.9d) and older piglets (N=9, age 37.8±4.9d). The change in minute ventilation on exposure to 10% O_2 in N_2 was 19.3±10.6% (NS) in the newborn and 29.4±11.2% ($p<.05$) in the older piglets. Pure oxygen transiently depressed ventilation by 53.1±5.1% ($p<.001$) in the newborn and 51.4±6.3% ($p<.001$) in the older piglets, indicating that the peripheral chemoreceptors are fully active in the newborn. The duration of the net apnea (water minus saline) was similar in the intact newborn, 9.27±1.48 sec ($p<.001$) and older piglet, 9.73±1.23 sec ($p<.001$). Carotid chemodenervation abolished the ventilatory response to oxygen but had negligible effect on the duration of laryngeal apnea. We conclude that recovery of spontaneous respiration after laryngeal induced apnea is independent of peripheral chemoreceptor activity. Our findings may have relevance to the clinical problem of sudden infant death, in which pathological abnormalities of the carotid body have recently been described.

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NEW EPIDEMIOLOGICAL EVIDENCE(SURVEY RESEARCH)TO ESTIMATE 2^o&3^o NEONATAL(NB)BED NEEDS IN URBAN AREAS. NYC INFANT TRANSPORT SERVICE (ITS EXPERIENCE). Angelo Ferrara. (Spon. by Joseph Dancis) NYU Sch.Med.-Bellevue Hosp. Ctr., Dept. Ped.

The formula for # of beds needed=# of NB in need of 2^o&3^o X (ALS)÷365X%Occup.2 methods were used:A)Transport Utilization Data during 1975-77,ITS moved an average of 10.2 neonates per 1000 live births(L.B.).100 neonates to one center showed that 64% went to 3^olevel care & 36% to 2^o with these average lengths of stay (ALS)(see Fig.1). The calculated bed estimates must be quadrupled to serve all preterms & sick terms. B)Perinatal Center Activity(born in,non-transported);1)A 6 month survey(1975-6)of 615 NB at Bellevue Hosp.(a Municipal with 9.8% pre-terms and 25.1% of mothers s prenatal care) showed 14.4% went to 2^o or 3^o care nursery; 2)Another survey at a voluntary hospital in NYC(7.8% preterm rate & with 11.9% s prenatal care) showed that 10.6% of its 2485 born-in NB went to a 2^o-3^o nursery; 3)In a 1977 national questionnaire of neonatal transport services(#35)the median % of born in sent to 2^o&3^o level areas was between 10-15%.Intramural (born-in) transports showed that 35% go to 3^olevels & 65% to 2^o (in contrast to extramural transports). RESULTS:A)With transport utilization methods & with 100% occupancy & above data 6.7 beds (2^o&3^o) per 1000 LB (82%-2^o & 18%-3^o)beds are necessary. B)With perinatal center activity method, with 100% occupancy rate & above data 7.3 beds(2^o&3^o)per 1000 LB-90%-2^o&10%-3^o are needed.

FIG.1-ALS LIVE(80%):To NICU 6.2days then 2^o25 days or direct to 2^o for 25 days.
DEAD(20%):NICU 8 days

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THYMIC RESPONSE TO ENDOGENOUS AND EXOGENOUS STEROIDS IN PREMATURE NEWBORN INFANTS. Barry D. Fletcher,Michel Masson, André Lisbona, Thomas Riggs, Apostolos N. Papageorgiou,(Spon. by Keith N. Drummond), University Hospitals of Cleveland, Dept. of Radiology, Cleveland and McGill University Jewish General Hospital, Depts. of Neonatology and Radiology, Montreal, Canada.

Thymic response to corticosteroid therapy for RDS was studied by measuring thymic width vs. transverse thoracic diameter on AP chest radiographs of premature newborn infants. Thymic-thoracic ratio (TTR) was evaluated in A)22 normal prematures, B)43 infants with RDS who received hydrocortisone or placebo postnatally (Pediatrics 50:526, 1972) and C)30 infants at risk for RDS treated with maternal betamethasone or placebo. In group A, TTR was unrelated to gestational age and was significantly smaller (mean 0.35) than in patients of group B and C with RDS, $P< 0.025$. On Day 1, TTR of steroid-and placebo-injected infants in group B were nearly identical (mean 0.42, 0.43) and declined at similar rates during the following 3 days to 63 and 69 percent of their original value respectively. Infants in group C who received betamethasone had a lower incidence of RDS than those given placebo. The TTR was significantly greater in patients who developed RDS(mean 0.42) than in those with normal lungs(mean 0.35),$P<0.05$.No relationship was observed between TTR and prenatal steroid dose or blood corticosteroid levels. The association of a high TTR and RDS suggest that steroids may have a parallel effect on thymus size and the pathogenesis of RDS. Hence measurement of TTR soon after birth could help identification of infants likely to develop RDS.

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MANAGEMENT OF INFANTS BORN UNDER CONDITIONS THAT ARE NOT ASEPTIC (INFANTS CONTAMINATED AT BIRTH). Antoine K. Fomufod (Spon. by Melvin E. Jenkins) from the Dept. of Pediatrics and Child Health, Howard Univ. Col. of Med., Washington, D.C.

This study was designed to determine and evaluate the current management procedures for newborns delivered under non-aseptic conditions. Firstly, a nationwide survey of neonatology centers was conducted to determine their practices in relation to the prevention and/or detection of post-contamination sepsis. Secondly, 100 consecutive contaminated infants who were cultured and followed at Howard University Hospital were studied.

Seventy-three percent of the centers surveyed (96) responded. Results of this phase of the study are as follows: 1) Infants contaminated at birth were routinely cultured by 75%; the commonest sites were umbilicus and nasopharynx; 2) Special cleansing bath (hexachlorophene) was employed by 15%; 3) Isolette care was routinely utilized by 42%; and, 4) 66% reported that the culture results did not influence management.

The phase two study cases included 15 low birth weight newborns. All infants were closely observed in isolettes for 72 hours for signs of possible sepsis, except when preliminary culture reports indicated a need for earlier intervention. No cases of clinical sepsis, septicemia or meningitis were encountered. The minor problems of mild jaundice, tremors and poor feeding noted in four infants spontaneously resolved shortly afterwards.

These preliminary findings suggest that the widely employed practices of routinely culturing and housing contaminated infants in isolettes may have no sound scientific basis, and, therefore, might be discontinued without adversely affecting their outcome.

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ESTIMATION OF CORD BILIRUBIN AS A MEANS OF SCREENING NEWBORNS AT RISK OF NEONATAL HYPERBILIRUBINEMIA. Antoine K. Fomufod (Spon. by Melvin E. Jenkins) from the Dept. of Pediatrics and Child Health, Howard Univ. Col. of Med., Washington, D.C.

Cord blood bilirubins were determined in 185 term Rh positive infants with uncomplicated intrapartum courses within 12-24 hours of birth by the method of Melloy-Evelyn. Infants with any manifestations of illness in the first four days of life were excluded. Daily physical examinations were performed on all infants but serial bilirubins were determined only in those who were clinically jaundiced. Healthy non-jaundiced infants were discharged on the fourth day of life. The neonatal courses were subsequently evaluated in terms of the development of pathologic jaundice (>5mg/dl/day or >12mg/dl), and correlated with the cord bilirubin values. The results indicated that during the first four days of life, infants with cord bilirubin values less than 2.0mg/dl had a benign course whereas those with 2.4mg/dl or greater developed pathologic jaundice requiring investigative and therapeutic intervention. This was particularly impressive in infants with levels ≥ 3.0mg/dl because all such infants required exchange transfusion within 24 hours of birth. There was a statistically significant difference ($P<0.05$) between the mean cord bilirubin of infants who developed pathologic jaundice requiring phototherapy and/or exchange transfusion (2.85), and those that did not (1.31).

These findings suggest that cord bilirubin might be used as a screening tool for pathologic jaundice in the first four days of life, and thereby facilitate early investigative and therapeutic intervention.