

1008

THE ASSOCIATION OF KERNICTERUS (KI) WITH BACTERIAL SEPSIS. Mark A. Pearlman, Lawrence M. Gartner, Kwang-sun Lee, Rachel Morecki and Dikran S. Horoupian.

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The only cases of KI detected at autopsy in neonates at this institution from 1971 through 1976 occurred in 3 infants with antemortem culture proven sepsis. During this period there were 14,210 deliveries, 387 transferred-in babies, 250 neonatal deaths and 178 autopsies. All 3 of the infants with KI weighed more than 2250 grams and had gestational ages of 36 or 37 weeks. Group B beta hemolytic streptococcal sepsis and meningitis was diagnosed in one infant, but the baby was never icteric. The second infant developed Klebsiella sepsis following spontaneous gastric perforation. The peak total serum bilirubin concentration (SBC) in this baby was 8.6 mg/dl. The third infant manifested E.coli sepsis at 8 hours of age and deteriorated despite appropriate antibiotic therapy; the peak total SBC was 15.6 mg/dl. The direct-reacting SBC in cases 2 and 3 never exceeded 1 mg/dl. All Apgar scores were at least 7 at 1 minute and 9 at 5 minutes.

During this period of time only 4 cases (3 with KI) were documented in which sepsis was proven prior to death and a subsequent autopsy was performed. The 3 infants with KI all died with their infection as the primary cause of death. The infant without KI, a 32 week 1850 gram baby, died of a massive CNS hemorrhage. This suggests that persistent bacterial sepsis may be a critical predisposing factor in the development of KI even in the presence of low serum bilirubin concentrations.

1011

Computer-Assisted Newborn Care: Paul H. Perlstein, Neil K. Edwards, Harry D. Atherton, and James M. Sutherland. Univ. of Cincinnati College of Medicine,

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Of 173 infants between 500-2400 grams with RDS and born in the same hospital, 33 were provided care in computer-monitored & controlled enclosed incubators. Only the availability of an unoccupied computerized incubator at the time of each of their admissions determined their selection. For purposes of analysis each of the 33 infants in the computer-assisted care study group was matched with the one infant in the remaining group of 140 routinely cared for infants that best matched the study infant for birth weight, sex, color, gestation, Apgar scores, maternal age, gravidity, parity, birth date, economic status, and major admission diagnoses. The matching of infants was confirmed statistically and was done by a neonatologist uninvolved with the study and having no foreknowledge of any infant's survival outcome. Four (12%) of the 33 study infants and 14 (42%) of the control infants died within the first 7 days of life. This difference was significant at $p < .01$. Although there was no significant difference in the number of infants in the two groups requiring mechanical respiratory support, the mortality rates of 17 study infants who received respirator care was significantly lower (11.8%) than the rate tabulated for 17 matched respirator-cared-for control infants (65%), ($p < .005$). Computer-assisted care, therefore, enhances infant survival by some mechanism that alters the outcome but not the need to support some infants with a respirator.

1009

ESTIMATION OF SERUM BILIRUBIN BY SPECTRAL REFLECTANCE OF THE SKIN. Keith J. Peevy, Larry Mumford, Robert Bruce, and Steven J. Gross, Duke University Medical

Center, Departments of Pediatrics and Ophthalmology, Durham, North Carolina (Spon. by George W. Brumley).

A study was undertaken to determine whether the serum bilirubin level could be estimated by the light reflectance of skin. The reflectance of skin over the abdomen was measured at five wavelengths ($\lambda = 629, 556, 511, 465, 424$), and compared with reflectance of a white standard. A formula was derived which related measurements of skin reflectance with serum bilirubin level. Thirty Black and 14 Caucasian term infants were then prospectively studied with simultaneous spectral reflectance and serum bilirubin levels. All infants were less than one week of age, and none had received phototherapy. Serum bilirubin levels ranged from 1 mg/dl to 12 mg/dl and correlated with spectral reflectance estimates with a coefficient of 0.94. Agreement was within 2 mg/dl in all cases. Measurement of spectral reflectance of skin is an accurate and non-invasive screening method for estimation of serum bilirubin.

1012

TRANSIENT HYPERAMMONEMIA IN TERM AND PRETERM INFANTS. Lynda Pollack, Thomas Hansen, James Adams, Jr., and

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We observed within 6 months 4 infants with severe hyperammonemia, only one of whom has a proven enzyme defect. Of the remaining 3, all appeared normal at birth with Apgars > 8 . All had blood $\text{NH}_3 > 2000 \mu\text{g/dl}$, severe neurologic impairment, seizures, and complete apnea. All were treated vigorously with peritoneal dialysis, protein restriction, and high glucose infusion. Case 1 was a 3110 gm male who required ventilatory assistance at age 4 h for respiratory distress. Initial NH_3 was 3000 $\mu\text{g/dl}$ at age 30 h. The patient died of respiratory distress at age 8 d with a falling blood NH_3 . Biochemical studies revealed no evidence of urea cycle defect or organic acid disorder. Case 2 was a 2950 gm female who fed poorly, had irregular breathing, and was found to have a blood NH_3 of 2700 $\mu\text{g/dl}$ at age 44 h. Blood NH_3 was normal by age 6 d; she tolerated normal protein intake and appears developmentally normal at age 4 m. Case 3 was a 2100 gm female product of a 35 wk gestation. Ventilatory assistance for respiratory distress was needed at age 10 h and initial NH_3 was 3000 $\mu\text{g/dl}$ at age 30 h. Blood NH_3 was normal by age 7 d. No inborn error was diagnosed, but the patient has not been challenged yet with normal protein intake. Case 2 and probably Case 1 represent severe transient hyperammonemia in term infants. Cases 1 and 3 were similar with early development of respiratory distress and NH_3 prior to feeding. We believe neonatal hyperammonemia is more common than is generally recognized.

1010

TEN YEARS EXPERIENCE WITH REGIONALIZED NEONATAL CARE. R. Perelman, G. Gutcher, S. Graven, R. Zachman.

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The Wisc. Perinatal Care Program including 6 regional centers has been functioning for over 10 years. Regionalization has offered educational enhancement to community health providers and allowed high risk mothers and infants more uniform exposure to intensive care and therapeutic advances. To assess the program's efficacy, we evaluated state mortality rates and compared these to national statistics. While the Wisc. birth rate of LBW infants has remained constant (6-7%), the death rate for these neonates decreased 32.7% over the survey period. Reflecting increased center utilization, 57% of neonatal deaths occurred in tertiary centers in '74, as opposed to only 20% in '68. Over the 10 yrs, the death rate during the first 24 hrs has decreased by 43% and during the first week by 36.1%. The decremental trend for Wisc. general and disease specific

Mortality Rate	1968	1969	1970	1971	1972	1973	1974	1975	1976
Overall:	U.S. 16.1	15.6	15.1	15.2	13.6	12.9	12.3	11.6	10.7(est)
	Wisc. 15.0	12.8	13.0	11.7	10.8	10.4	10.2	9.70	8.90
HMD/RDS:	U.S. 2.36	2.48	2.61	2.68	2.75	2.73	2.62	2.42	2.14(est)
	Wisc. 2.83	2.10	1.98	1.92	1.59	1.53	1.98	1.58	1.51

neonatal death rates has consistently surpassed national norms. Deaths/1000 live births due to HMD/RDS have continued to fall despite persistent high national trends. Further, Wisc. was unique among states with $> 50,000$ births/yr in showing decreasing HMD/RDS death rates between '68-'73. Maintenance of low, declining neonatal mortality rates and consistent reduction in deaths from major causalities with a marked shift in timing and place of death, establishes the positive influence of regionalized care.

1013

DIFFERENTIATING DISEASE-RELATED FROM ENVIRONMENTAL FEVER IN THE NEWBORN. Jeffrey Pomerance, Janet Meredith, Richard Brand (Spon. by B. M. Kagan).

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Often it is difficult to differentiate disease-related fever from overheating in the newborn. This study was undertaken to establish the relationship between rectal temperature (RT) and peripheral skin temperature in the normal and overheated term infant, and to compare it with that relationship in infants with fevers that were known to be disease related.

Forty-three two-day-old normal infants were studied. Initial RT was found to be between 96.6 and 99.5 $^{\circ}\text{F}$. Each infant was then placed in an incubator. Ambient temperatures were selected in such a manner as to maintain RT between 98.0 and 99.6 $^{\circ}\text{F}$. Incubator temperatures were raised or lowered in small increments allowing 15 minutes equilibration at each setting. After equilibration, RT and anterior mid-lower leg skin temperature (LT) were recorded simultaneously. One-hundred and twenty paired RT's and LT's were obtained. Plotting LT against RT yielded a correlation coefficient of +0.68. No infant with a rectal temperature $\geq 99.0^{\circ}\text{F}$ had greater than a 4.0 $^{\circ}\text{F}$ difference between RT and LT.

LT's were also measured in 7 infants with fevers known to be disease-related. RT-LT difference ranged between 6.5 and 12.9 $^{\circ}\text{F}$. This difference is significantly above the highest RT-LT difference recorded in normal infants with RT's $\geq 99.0^{\circ}\text{F}$ ($p < .05$). These findings confirm observations by others that in the presence of disease-related fever, extremities feel relatively cool.