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A Barnes M-101 Infrared Radiometer was used to map the skin temperature changes occurring on the backs of nine selected unswaddled newborn babies in a room air conditioned at 26.3 °C (range 24.4–28.1 °C). Polaroid photographs of the serial thermal variations observed during cooling were analyzed with a densitometer to provide quantitative support for grossly evident differences in rates of cooling over the surfaces examined. In particular, not only the interscapular but also the posterior flank skin regions cooled significantly less ($p < 0.05$) than skin over the coccyx, deltoid, midback, and lateral flank regions. Brown fat collections have been identified in the interscapular fat pads of newborns, and thermography may prove a valuable aid in monitoring the activity of this tissue. On the other hand only small amounts of multilocular fat have been identified in subcutaneous flank tissue. Since in this early experience with thermography the flank tissue has been found to mirror the interscapular tendency to cool relatively little in cold stressed babies, continued caution must be exercized in interpreting the significance of the 'warm nape of the newborn' as it relates to brown fat activity. Further experience with radiometry may prove useful in clarifying this and other enigmatic problems relating to the complex flux of heat in newborn babies.

147 *Inhibited Lipolysis by Hypoxia: Its Potential Role in Neonatal Thermogenesis.* DAVID BAUM, COURTNEY, L. ANTHONY, Jr. and CAROL STOWERS, Univ. of Washington Sch. of Med., Seattle, Wash.

Because of impaired thermogenesis, cold stress is poorly tolerated by hypoxic neonates. Since free fatty acids (FFA) are a major fuel for heat production, deficient FFA mobilization could contribute to reduced heat production at low oxygen tensions. In order to determine the effect of hypoxia upon cold-stimulated lipolysis and its potential role in thermogenesis, plasma glycerol and FFA levels, and deep rectal temperature were studied in cooled puppies made hypoxic.

Upon lowering ambient temperature from 30 to 20 °C, levels of plasma glycerol and FFA increased in 12 puppies ventilated with air ($PaO_2 < 75$ mm Hg). In contrast to persisting high plasma glycerol and FFA levels with continued cooling in the control group, plasma glycerol fell from $172 \pm 8\%$ to $85 \pm 10\%$ and FFA from $206 \pm 25\%$ to $105 \pm 13\%$ mean control values (mean $\pm$ S.E.) in six animals made hypoxic (PaO_2 25–35 mm Hg) for 45 min. Comparison of core temperatures during cooling revealed that the rate of temperature fall was accelerated by hypoxia, and that the mean peak fall was significantly greater in hypoxic than in control animals ($p < 0.005$).

These observations indicate that lipolysis stimulated by cold stress is inhibited by hypoxia, which results in the reduction of FFA as a fuel source. This loss of FFA as a fuel may explain the handicap to thermogenesis observed in the hypoxic neonate.

148 *Large Insensible Water Loss (IWL) in Low Birth Weight Infants Treated with a Plastic Heat Shield.* AVROY FANAROFF, HOWARD GRUBER, MICHAEL WALD and MARSHALL KLAUS, CWRU Sch. of Med., Dept. of Ped., Cleveland, Ohio.

Published fluid requirements appear to be grossly inadequate for some small premature infants. To explain the large water needs of these infants, detailed water balance studies were performed during the first six weeks of life on 22 infants whose birth weights ranged between 700 and 1,800 g, mean 1,232 g, and whose weights were appropriate for their gestational age. IWL determinations were made from measurements of loss in body weight over 3-h periods, with the infants nude in standard single walled isolettes, humidity 45 to 90% and the environmental air temperature in the neutral thermal range. In 9 infants with birth weights under 1,200 g, who were below 10 days of age, IWL was 2 to 4 times greater (equivalent to 80 to 120 g/kg/day) than previously reported for larger infants. To elucidate these large losses, paired measurements were made within 24 h on 11 infants before and after the insertion of a plastic heat shield converting the isolette into a double walled chamber. Mean IWL within the double walled chamber was 1.50 g/kg/h S.D. 55 compared to a mean of 2.18 g/kg/h S.D. 1.0 under standard conditions ($p < 0.001$). There is thus a 30% decrease within the double walled chamber. These results, in contrast to previous reports, indicate the ability of the small premature infant to markedly increase IWL in a relatively cool environment. These large losses can be reduced by diminishing radiant heat losses. Heat shields are useful not only for controlling the thermal needs of small immature infants but also in significantly reducing fluid requirements.

149 *Poverty and Race: Effects on Prenatal Nutrition.* RICHARD L. NAEYE and WILLIAM BLANC, Pennsylvania State Univ. Coll. of Med. and Columbia Univ. Coll. of Physicians and Surgeons, Depts. of Path., Hershey, Pa. and New York City.

Perinatal mortality rates are higher in the U.S. than in many other nations. An excess number of low birth weight infants in families of low socioeconomic status accounts for much of this high perinatal mortality. Necropsy material was examined from 1,002 consecutive autopsies on stillborn and newborn infants. 449 of the cases were excluded because of disorders that might have affected fetal growth. Income data was available on 469 of the remaining cases and they were classified by economic status using a U.S. Government poverty index. Autopsy weights and measurements were calculated in percent of published normal mean values.

Body weight for infants from poor families was 15% less than the mean value for infants from non-poor families. Mean gestational age for both groups was 29 weeks. In infants from poor families, weights of thymus, spleen, liver and adrenal glands were disproportionately smaller than weights of other organs. Brain and placental weights were almost identical in the two groups. The following additional measurements were less in the poor infants: thickness abdominal subcutaneous fat, mean volume adipose cells and skeletal muscle fibers, cytoplasmic mass of cells in various visceral organs and Wharton's jelly. If organ structure in the non-poor group is considered to be normal, infants from poor families were undernourished at birth. Racial groups showed few differences when they had similar economic status. In the poor, undernutrition became more severe with each gestation while nutrition-status improved with each gestation in the nonpoor.

150 *The Effect of Early Mother—Infant Separation on Later Maternal Performance.* JOHN H. KENNELL, DAVID GORDON and MARSHALL H. KLAUS, Case