

- 142 *Metabolic Responses to Physiologic Stimuli in the Newborn.* KENNETH R. KOSKINEN, LYNNE L. LEVITSKY, ERIC FINE and MARVIN CORNBATH, Univ. of Maryland, Dept. of Ped., Baltimore, MD.

In order to evaluate the physiological adaptations to feeding in low birth weight for gestation infants and the infants of gestational diabetic mothers (IGDM), blood glucose (G), plasma insulin (PI) and free fatty acid (FFA) responses to the ingestion of formula by 42 normal newborns were studied in the first three days of life. These measurements were made at fasting, and 30 and 60 min after feeding. Blood glucose values rose significantly over fasting at 30 min on all 3 days, and the values at 30 min on day 3 were significantly higher than those on day 1. The only significant change in the FFA values was a lower fasting value on day 3 than on day 2. Fasting PI values on day 1 were significantly higher than those on day 3. The decrease in PI values and relatively stable FFA values after formula feeding are in contrast to changes that occur with the administration of a large quantity of glucose either orally or intravenously. This difference in metabolic homeostasis was apparent not only in the normal infant but in the IGDM and low birth weight for gestation infants as well.

- 143 *Cardio-respiratory Changes Associated with Gavage Feedings.* E. G. HASSELMEYER and E. H. HON, Yale Univ. Sch. of Nursing and Med., New Haven, Conn. (introduced by C. D. Cook).

An exploratory study of the effects of gavage feedings upon neonatal ECG, heart and respiratory rates was carried out in 8 healthy, asymptomatic, low birth weight infants (b. wt. 885–1,605 g; gestation ages 28–36 weeks). Enrollment ages ranged from 3 to 27 days. Data were collected by attaching four silver electrodes to the chest wall and connecting them to a prototype system providing meter display and strip chart recordings of heart and respiratory rates and oscilloscopic display of ECG; data were also recorded on magnetic tape. 48 feedings were studied; 6 per infant. A no. 5 feeding tube marked at one inch intervals was passed through the nostril or mouth; feedings were given by the push method. ECG, heart and respiratory rates were recorded for a minimum of 20 min before and after gavage. In 21 feedings, heart rate drops greater than 30 were observed when the catheter was passed; in 18 of these, the tube had been inserted only 4 to 6 inches. Feeding volumes (10–45 ml) were given within 30 to 138 sec; heart rate drops from 30 to 110 were observed 13 times with push feedings. One case of bradycardia with heart rate drop greater than 90, of 36 sec duration, occurred p.c. when infant was prone in high Fowler's; this was accompanied by p. wave changes to point of momentary elimination. Apnea of longer than 20 sec, but without heart rate and ECG changes, was observed in two babies in association with bowel movements. The interesting clinical observations noted in these patients suggest that the cardio-respiratory responses of small infants can be altered markedly by widely accepted clinical procedures.

- 144 *Colonization of Newborn Infants with R-factor Carrying Gram-negative Organisms.* ROSE MARIE J. APOSTOLICO, KATHLEEN L. DAVIS, DONALD V. EITZMAN and HERMAN BAER, Depts. of Ped. and Micro-Biol. Univ. of Florida Coll. of Med., Gainesville, FA.

Recently, increasing numbers of gram-negative organisms with multiple drug resistance have been

cultured from infants. The majority of these cultures were obtained from areas in which a high percentage of infants were being treated with antibiotics, primarily penicillin and kanamycin. A prospective study was done to determine incidence, age of appearance, and predisposing factors to R-factor carrying *Enterobacteriaceae* in the nursery. Cultures were obtained from groin, umbilicus, axilla, nose, throat, eyes, and stool at 12-h intervals for the first three days of life and then daily. Ninety percent of the infants in the intensive care nursery were found to have R-factor carrying bacteria during their stay in the nursery. The mean age of acquiring these organisms was 3.8 days with a range of 1–10 days. The incidence was essentially the same for infants regardless of whether they had been treated with penicillin and kanamycin or no antibiotics. Infants in the regular nursery, many of whom stayed 6 days, had a less than 10% incidence of R-factor carrying gram-negative organisms. These organisms were found only sporadically on the fomites and in fecal and vaginal cultures of the mothers, but could be recovered from personnel working in the intensive care nursery. Most of these personnel also worked in the regular nursery and handled babies who had a low incidence of R-factor carrying organisms. It is presumed that the high incidence of R-factor carrying *Enterobacteriaceae* found in the intensive care nursery is related to the use of antibiotics such as kanamycin in this area. Multiple drug resistance should be looked for in clinical situations such as this and treatment adjusted accordingly.

- 145 *Effect of Cooling on Effective Pulmonary Capillary Flow in Newborn Infants.* JUNE P. BRADY, HENRIQUE RIGATTO and FE M. DUMPIT, Dept. of Ped., Univ. of California, San Francisco and San Francisco Gen. Hosp.

To determine whether cooling affects pulmonary perfusion in the newborn infant we measured effective pulmonary capillary flow (Q_{pc}) at two different environmental temperatures. Seven healthy term infants 15 to 61 h of age were studied initially in a 'cool' environment (ambient temperature 29.6°C) and then in a 'warm' one (32.7°C). Q_{pc} was measured using the infant plethysmograph and a 15-sec period of re-breathing nitrous oxide and oxygen, as previously described [Circulation Suppl. 21: 50, 1969]. The mean value of two determinations at each temperature was compared. The infant's rectal, abdominal skin, and foot temperatures, and the plethysmograph and room temperatures were monitored. Heart rate was measured from an electrocardiogram.

The mean foot-rectal temperature gradient was 5.1°C in the 'cool' environment and 2.6°C in the 'warm' one. Abdominal-rectal gradients were 0.8°C and 0.1°C respectively. In each instance Q_{pc} was lower in the 'cool' environment (mean 141 ml/kg/min-'cool'; 192 ml/kg/min-'warm'; $p < 0.05$). Heart rate was lower (121/min-'cool'; 128/min-'warm') but this was not statistically significant. This reduction in effective pulmonary capillary flow could be due to increased shunting (the method does not measure shunted blood), to marked inequalities of ventilation and perfusion, or to a decrease in total pulmonary blood flow. Our results provide further evidence of the possible adverse effects of cooling the newly born infant.

- 146 *Thermal Patterns on the Backs of Cold Stressed Babies.* PAUL H. PERLSTEIN, NEIL K. EDWARDS,