results are compatible with the patient having MPS I (Hurler's syndrome) but do not explain why chondroitin sulphate was the principal urinary and hepatic glycosaminoglycan.

**Blood pressure and angiotensin II in the newborn.** F. P. Pipkin and O. R. C. Smales (introduced by D. Hull). City Hospital, Hucknall Road, Nottingham.

Angiotensin II (AII) is the most potent naturally occurring pressor agent known. It has been measured by radioimmunoassay on 1–2 ml plasma obtained from infants in the first week of life at the time of sampling for routine investigations. Systolic blood pressure was measured before sampling, using the Doppler ultrasound technique. Venous samples were obtained from 25 infants in whom physiological jaundice or prematurity was the only abnormality. 20 infants were sampled in whom there were additional clinical complications, such as respiratory distress or vomiting. AII levels fell from a mean of 178·4±26·2 SE pg/ml in cord venous blood at birth to a mean of 60·3±9·2 pg/ml during the first 6 days of life. Mean adult values were 28·8±4·2 pg/ml as compared with 97·5±9·0 in pregnant women at delivery. AII levels were higher in preterm infants than in term infants (mean 75·6±11·4 pg/ml against 54·6±12·1 pg/ml), but this was not statistically significant. Systolic blood pressure in 70 infants increased significantly during the first week of life (P <0·001, r = 0·5490), but was more closely related to birthweight (P <0·001, r = 0·7411, no. = 66) and gestational age (P <0·001, r = 0·7313, no. = 67). There was a significant inverse relation between the mean arterial blood pressure and venous AII in the 45 infants in which both were measured (P <0·01).


Semimicro methods for the measurement of plasma renin activity (PRA) and plasma aldosterone concentration (PAldo) by radioimmunoassay have been developed using 0·25 ml plasma and between 0·5 ml and 1·0 ml plasma, respectively. Normal ranges for healthy children on free diets have been established and it was found that values of PRA and PAldo varied inversely with age. In infants, the mean PRA value was 1404 pgAI/ml per h (range 472–3130) with a progressive decrease through childhood to the mean adult value of 85 pgAI/ml per h (range 22–311). In children under 1 year of age the mean value for PAldo was 24 ng/100 ml (range 8·3–75). There was a similar decrease with age, such that mean value between 5 and 9 years of age was 4·5 ng/100 ml (range 1·0–15), but this was followed by a slight rise to the adult mean of 8·2 ng/100 ml.

PRA and PAldo values were considerably greater in children with evidence of saline depletion than in healthy children of equivalent age. Children with hypernatraemic diarrhoeal dehydration were found to have lower values of PRA and PAldo than children with gastroenteritis but no evidence of hypernatraemia. In children with chronic saline depletion PRA values were markedly increased with a mean figure of 25 000 pgAI/ml per h. However, PAldo values were not uniformly raised and those from children with adrenal insufficiency were within the normal range compared with the very high values from the other salt-wasters. The relation shown between PRA and PAldo in individuals with no abnormality of the aldosterone response to renin/angiotensin stimulation permit identification of situations in which inappropriate responses occur, e.g. congenital adrenal hyperplasia and Conn's syndrome.

**Is human milk the best food for preterm infants?** D. P. Davies. Department of Child Health, University Hospital of Wales, Cardiff.

Since the early days of caring for preterm infants it has been widely held that human milk is the food of choice for these infants. This belief, however, has not prevented some paediatricians from suggesting that human milk might not in fact be the ideal food on the grounds that its low protein content is insufficient for growth requirements. Adequate protein intake in the early weeks of life is necessary if growth is to proceed normally. Failure to grow satisfactorily at this stage might result in permanent detrimental effects on body growth. The question of optimum protein requirements for preterm infants is therefore an important one. The present study investigates the adequacy of human milk for the growth of preterm infants. 106 preterm infants were fed one of three isocaloric milks for a period of 2 months. Milk A: high protein milk (21% calories as protein); milk B: medium protein milk (15% calories as protein); milk C: human breast milk (7% calories as protein). Changes in weight, length, head circumference, and triceps skinfold thickness were evaluated. The results suggest that though human milk is adequate for the growth needs of the more mature preterm infants (33–36 weeks’ gestation), less mature infants (28–32 weeks’ gestation) fed human milk failed to achieve adequate growth rates compared with infants on higher protein intakes.

**Fat absorption and weight gain of small babies fed two filled milk formulae.** R. D. G. Milner, Y. Deodhar, C. R. Chard, and R. M. Grout. St. Mary's Hospital, Hathersage Road, Manchester M13 0JH.

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**Calorific cost of activity in neonates.** J. Meyer (introduced by J. Scopes). St. Thomas's Hospital, London S.E.1.

The data on calorific expenditure on activity in neonates are incomplete. An experimental situation was devised where total calorie balance studies could be
performed in an environment which was precisely the same as that in which the babies were normally nursed. Activity was monitored by a non-touch technique. 3 groups of babies were studied over the first 3 weeks of life. Each period of measurement lasted from 4 to 9 hours within a 24-hour calorie balance period. The subjects were 11 babies of over 37 weeks' gestation and of birthweight <5th centile, 16 normally grown babies of <36 weeks' gestation, and 11 infants of diabetic mothers. 6 term normal infants were also studied.

It was shown that activity accounts for 15–20% of calorie expenditure in term babies in the first 24 hours whether small-for-dates, heavy-for-dates, or normally grown. The preterm infant expends significantly less energy on activity in the first day. From the second to fifth day activity fell slightly in the term infants but rose in the preterm babies. Thereafter, each infant seemed to develop its own pattern of rest and activity and no clear differences were discernible between the groups. The effect of swaddling on activity was also noted. For the first 4 or 5 days there was no significant difference in energy expenditure on activity (though the basal metabolic rate and evaporative water loss were higher) between the naked babies and those dressed fully in nighties, nappies, and blankets. After this time swaddling did indeed reduce movement.

Oxytocin, prostaglandin, and neonatal jaundice.
J. Wynne, A. D. Milner, and A. K. Hodson. City Hospital, Hucknall Road, Nottingham.

One possible reason for the recent increase in the incidence of neonatal jaundice is the widespread use of oxytocic drugs in labour. We have measured serial bilirubin levels in 53 cases. In 23 cases of term neonates, (1) Spontaneous onset of labour (20); (2) labour induced, or hastened, with oxytocin (26); (3) labour induced with oral prostaglandin PGE2 (28). Excluded were babies of low birthweight (>2.5 kg), gestation 37 weeks or less, positive direct Coomb's test, infected ill babies, cephalohæmatoma.

On day 2 the mean bilirubin level was 7.7 mg in the prostaglandin induced group, compared to 6.5 mg in the oxytocin group, and 5.9 mg in the control group. At 5 days mean bilirubin levels were 7.9 mg, 5.9 mg, and 6.0 mg, respectively. The differences in bilirubin levels between the prostaglandin group and the controls were significant (P <0.01) on day 2 and on day 5 (P <0.05). The bilirubin level was clinically significant (>12 mg/100 ml) in one control baby, in 3 from the oxytocin group, and in 4 from the prostaglandin group. These results do not support the suggestion that the use of oxytocin in labour is responsible for the increase in neonatal jaundice. The apparent increase in the prostaglandin induced group requires further investigation.


The Cole pattern endotracheal tube, often used for newborn resuscitation and intensive care, was introduced as having a lower resistance to air flow than a plain tube of similar size. When tubes of similar external diameter at the tracheal end are studied it is seen that resistance is in fact higher in Cole pattern tubes than in plain ones. This is due to turbulent airflow produced by the sudden change in diameter, and to greater wall thickness. The same disadvantage applies to Jackson-Rees tubes, where the change in diameter is accompanied by a change in direction of airflow.

Cave and Fletcher (1968) suggested that as 2.5 mm ID tubes (12 FG) had a high resistance compared with the infant's airway resistance they should be used in association with artificial ventilation. The present study suggests that though this is true for FG tubes, 10 FG ones are probably acceptable for spontaneous ventilation in a quietly breathing baby.

Reference


The relation between CSF and serum osmolality was studied in 16 patients with hyperosmolar hypernatraemic dehydration at the time of admission to hospital. During rehydration the serum osmolality, electrolyte concentrations, blood urea nitrogen, and pH were measured serially. After correcting shock and severe metabolic acidosis, all patients were rehydrated with 0.45% saline in 5% dextrose over a period of 48–72 hours. 5 patients developed neurological abnormalities during the course of therapy within 48 hours of admission (convulsions 2, convulsions with hemiplegia 2, hemiplegia 1). Of these, 3 had residual defects on follow-up examination. The two groups of patients (those with and those without neurological abnormality) were indistinguishable on clinical grounds before rehydration. Analysis of routine admission and sequential serum biochemical variables also failed to discriminate between them.

Determination of the osmolality of CSF and serum on admission showed a significant osmolar gap in most patients, ranging from 46 mOsm/kg H2O higher in CSF than serum to 41 mOsm/kg H2O higher in serum than CSF. Severe neurological disturbance occurred only in the presence of a CSF of 8 mOsm/kg H2O or more greater than serum osmolality. Rapid accurate prediction of neurological disturbance, before embarking on rehydration, may thus be possible. The result of discriminant analysis of the osmolar data was presented and the implications for therapy discussed.

Study of a group of children who initially had convulsions associated with fever and later developed epileptic attacks in the absence of pyrexia. D. H. Mellor, I. Lowitt, and D. Hall. City Hospital, Nottingham; and Royal Aberdeen Children's Hospital and University of Aberdeen, Department of Mental Health.