Paediatric Research Society

Autumn Meeting, Edinburgh, 6 and 7 October 1972

Familial factors and perinatal problems in idiopathic childhood epilepsy. D. H. Mellor, I. Lowit, and D. J. Hall introduced by G. Russell. Department of Child Health, University of Aberdeen.

As part of a study of childhood epilepsy, 128 school-children were identified who had been diagnosed as having epilepsy but who had no evidence of cerebral malformation, postneonatal brain damage, or abnormality on neurological examination. A history of epilepsy in a near relative was obtained in 40 of these children (familial subgroup) and was absent in the remaining 88 (nonfamilial subgroup). A control matched for age, sex, and school class was available for each study child. Prospectively recorded perinatal data were obtained for both study and control children. The incidence of 6 prenatal, 3 natal, and 6 neonatal factors known to be associated with a high risk of perinatal mortality was determined in each subgroup. On analysis it was found that there was a significantly greater incidence of adverse perinatal factors in the nonfamilial subgroup as compared to its control group and to the familial subgroup. On the other hand, there was no significant difference between the familial subgroup and its control group or between the two control groups.

These findings in the nonfamilial subgroup would lend support to the theory of a continuum of reproductive casualty in which conditions known to be associated with perinatal mortality are also associated with neurological dysfunction in survivors. The results also have implications for the prevention of epilepsy in this nonfamilial subgroup. However, the lack of association in the familial subgroup suggests that greater avoidance of adverse perinatal events may not prevent the appearance of epilepsy in such children.

Effect of renal function on plasma calcium in the newborn. L. Stimmler, G. A. I. Snodgrass, and D. Brown. Department of Paediatrics, Guy's Hospital, London.

Previous studies have shown that plasma calcium levels at 1 week of age are inversely related to plasma phosphate levels (Snodgrass *et al.*, 1971). These authors also noted that whereas in breast-fed infants there was almost invariably a rise in plasma calcium level between the 1st and 7th day, in infants on cow's milk feeds there was a fall of up to 2 mg/100 ml in a third of the cases.

In the present study, all infants were on either Ostermilk or Cow & Gate feeds. Blood was collected on the 1st and 7th day for plasma calcium, phosphate, creatinine, and urea. In addition, on the 7th day a

24-hour urine was obtained, also for calcium phosphate, creatinine, and urea estimation. The significant findings were as follows. (1) There was an inverse relation between plasma phosphate and urinary phosphate concentration. (2) The urinary phosphate : plasma phosphate ratio was directly related to the urinary creatinine : plasma creatinine ratio, and urinary urea : plasma urea ratio. (3) Infants who showed a rise in plasma calcium between the 1st and 7th day had significantly higher urinary creatinine : plasma creatinine ratios than those infants who showed a fall in calcium.

It is concluded that poor glomerular filtration in the first week of life accounts in part for the raised plasma phosphate levels in infants. The latter, in turn, is one cause for the hypocalcaemia of infants who are fed cow's milk.

REFERENCE

Snodgrass, G. A. I., Stimmler, L., and Went, J. (1971). The effect of various milk feeds on the neonatal calcium, magnesium, phosphate and protein levels. *Clinical Science*, **40**, 22P.

Static pulmonary compliance in early childhood. J. J. Cogswell, D. J. Hatch, D. Hull, A. D. Milner, and B. W. Taylor. The Hospital for Sick Children, Great Ormond Street, London.

Pulmonary compliance reflects lung stiffness, and it may be decreased in a number of pathological situations. Dynamic compliance determinations in rapidly breathing infants are often not accurate, especially when airways resistance is raised.

Two methods of measuring static compliance in babies under 3 years were described. In both methods volume changes were recorded by an inflatable rubber jacket (Milner, 1970). In babies with endotracheal or tracheostomy tubes an apnoeic technique was used in which general anaesthesia and tightly fitting tubes were not necessary (Hatch *et al.*, 1972). In those without an artificial airway, compliance was measured during spontaneous breathing into a pressurized drum (Lewis, 1969) via a tightly fitting face mask.

Both methods gave comparable results when performed in the same infants. Normal data and examples of compliance measurements in different clinical conditions were presented.

REFERENCES

- Hatch, D. J., Milner, A. D., Cogswell, J. J., and Hull, D. (1972). Measurement of compliance in infants and young children using the respiratory jacket. *British Journal of Anaesthesia*, **44**, 624.
Lewis, S. R. (1969). Mechanics of respiration in the human infant with special reference to pulmonary compliance. Ph.D. Thesis, University of London.
Milner, A. D. (1970). The respiratory jacket. A new method for measuring respiration. *Lancet*, **2**, 80.