Paediatric Research Society

17th Meeting, Leeds General Infirmary, 23 and 24 October 1970

Abstracts of Papers

18-Year Follow-up on Eyes of Ex-premature Infants: Retinopathy of Prematurity. David Baum (*Hammersmith Hospital, London W.12*). Ophthalmic examinations have been performed on 52 ex-premature infants who had reached their late teens. These patients all weighed 1500 g or less at birth, and were born during a period of transition from liberal to restricted oxygen therapy for premature infants.

Fourteen patients had some degree of retrolental fibrosis. In 4, there was complete, bilateral, destructive retrolental fibroplasia (RLF) with microphthalmos; and in 3 patients in whom RLF was complete unilaterally, the other eye showed retinal scarring with traction of the disc in 2 patients and extreme tortuosity of the retinal arteries in the third. There were 7 patients who showed bilateral retinal scarring with distortion of the retinal architecture; 35 patients showed tortuosity of the retinal arteries. 3 patients had normal retinas.

It seems that tortuosity of the retinal arteries represents a persistence of the proliferative stage of RLF; these changes are presented as stigmata of prematurity; there is no associated ophthalmic morbidity.

Myopia was associated with retrolental scarring, but not with tortuosity of the retinal arteries. Corneal curvature was normal in these patients, excluding this as the cause of the myopia of RLF.

Double-blind trial of effects of aspartic acid, orotic acid and glucose on serum bilirubin concentrations in infants born before term. Alex Mowat (*introduced by Ross Mitchell*) (*King's College Hospital, London*). The transient unconjugated non-haemolytic hyperbilirubinaemia of the human newborn infant is associated with a limited ability of the liver to conjugate bilirubin with glucuronic acid. It has been postulated that hyperbilirubinaemia may be due to a relative deficiency of the glucuronide donor, uridine diphosphate glucuronic acid, which could be corrected by the administration of uridine precursors, aspartic acid and orotic acid.

A double-blind controlled trial of aspartic acid, orotic acid, and glucose in the treatment of unconjugated non-haemolytic hyperbilirubinaemia in preterm infants is described. Infants of known gestational age, from 31 to 39 weeks, were allocated to one of three groups matched for sex and gestational age. They received in double-blind fashion equimolecular amounts of

aspartic acid (12), orotic acid (11) or glucose (11) as determined by body weight. All infants had a similar feeding regimen.

Serum bilirubin levels were determined on days 2, 4, 6, and 8. There were no statistical differences in mean or maximal serum bilirubin levels between treatment groups and controls. In male infants receiving aspartic acid, the maximum serum bilirubin levels on days 4, 6, and 8 compared with that on day 2 were significantly lower than those in other groups, but there were no other statistically significant differences. It is concluded, therefore, that neither aspartic acid nor orotic acid has a place in the management of neonatal hyperbilirubinaemia.

Phenylalanine transport in utero. S. P. Robins, D. T. Baird, F. Cockburn, J. R. B. Livingston, and I. I. Smith (*Department of Child Life and Health, University of Edinburgh*). A gravid uterus removed at 18 weeks gestation was perfused through both uterine arteries with an oxygenated blood plasma mixture. An average flow rate of 53 ml per minute (approximately 6 ml/100 g per minute) was achieved with perfusion pressures of 150–170 mm Hg. Total perfusion time was 100 minutes.

Fetal heart rate was monitored by a Sonicaid detector. Serial amniotic fluid samples were removed through an indwelling catheter and the venous effluent collected in 500 ml fractions. After 30 minutes, H^3 -(L)-phenylalanine in plasma was infused into the perfusing fluid at 2 ml/min for 20 minutes. 53% of the total tritiated material infused was retained in the preparation. Significant radioactivity was detected in the amniotic fluid 30 minutes after starting the H^3 -(L)-phenylalanine infusion. Thereafter the activity continued to increase reaching $368 \times 10^{-6} \mu\text{Ci/ml}$ at the end of the study.

Radioactivity in fetal plasma was $13,142 \times 10^{-6} \mu\text{Ci/ml}$ of which 12% was found to be associated with the protein fraction. 3H -tyrosine was not detected in fetal plasma ultrafiltrate. Radioactivity in fetal urine was $131 \times 10^{-6} \mu\text{Ci/ml}$.

Tissue autoradiography showed localization of activity in the syncytiotrophoblast, on the fetal red blood cell, in liver macrophages, and in the proximal but not in the collecting renal tubules.

These results indicated that there was probably little contribution by fetal urine to the amniotic fluid pool of phenylalanine and showed the absence of an active phenylalanine hydroxylase system at 18 weeks' gestation.