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Neonatal bacteriuria and 'Uriglox'. S. Dosa and I. B. Houston. (*Department of Child Health, St. Mary's Hospital, Manchester.*) 'Uriglox' is a paper strip technique intended to detect bacteriuria by showing the consumption of glucose normally found in urine (by the metabolically active bacteria). Problems were foreseen in its application to the diagnosis of bacteriuria in the newborn and a trial was designed to test its reliability.

423 newborn babies 3 to 10 days old were studied; 65 (15.1%) were found to have $>10^5$ bacteria/ml urine at the initial culture but further repetition, culminating in suprapubic bladder aspiration showed that none had a true bacteriuria. In 63 of these 65 contaminated specimens, the Uriglox test was normal but overall 4 out of 423 tests were abnormal, a false positive rate of 0.9%.

For comparison, urine specimens were obtained by suprapubic aspiration from 27 infants suspected of having bacteriuria (on the basis of earlier urine cultures using per-urethral collections). 19 specimens were sterile, 8 specimens contained $>10^5$ bacteria/ml and 5 of these also had an abnormal Uriglox test. This gave a false negative rate of 3 in 8.

More than 100 leucocytes/ μ l urine were found in 3.3% of the normal urine specimens and in 5 of the 8 bacteriuric samples; one urine specimen with true bacteriuria contained less than 10 leucocytes/ μ l.

We conclude that, in the circumstances of this study, the proportion of false negative results is too high to justify the use of Uriglox for screening babies for bacteriuria. The low incidence of bacteriuria in the newborn group studied is also worthy of further comment.

Response to glucagon in small-for-dates hypoglycaemic newborn infants. Marthe A. Le Dune (*introduced by G. Arneil*). (*Department of Child Health, Royal Hospital for Sick Children, Glasgow.*) To be published in full in the *Archives*.

Study of immunoreactive pancreatic glucagon in the newborn period. D. I. Johnston and S. R. Bloom (*introduced by Alexander Mowat*). (*Department of Child Health, King's College Hospital, London.*) Pancreatic glucagon (PG) stimulates hepatic glycogenolysis, lipolysis, and may induce and activate rate-limiting steps in gluconeogenesis. These functions suggest that this hormone is relevant to the homeostasis of the newborn. Until now, methods for PG measurement have been too crude to evaluate its role in this age group.

A sensitive immunoassay for PG has been developed. The design of the assay follows the principles suggested by Albano and Ekins (1970). Using 100 μ l plasma it can detect changes of 25 pg/ml within 95% confidence limits. Cross-reaction with glucagon of gut origin is avoided by the use of a specific antiserum.

PG was measured in maternal and cord blood in over 80 deliveries. Labour caused a rise in maternal PG. In 50 normal deliveries the mean difference between maternal and cord values was not significant. In 20 deliveries with evident fetal distress (scalp pH <7.20) the mean cord value was significantly greater than the maternal level.

At 2 hours after delivery the peripheral venous PG of premature and small-for-dates infants showed a significant rise over the cord value. The rise in normal term infants was less significant. All infants had higher levels at 2 hours than their mothers.

This study indicates that the infant is capable of autonomous PG production at delivery. There is no evidence of impaired secretion in very premature infants or in SFD infants. PG appears to be produced in response to the metabolic demands of fetal distress.

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Clinical pharmacology of gentamycin in the newborn. R. D. G. Milner, Julia Ross, and D. J. R. Froud. (*Department of Child Health, University of Manchester, and Roussel Laboratories Ltd., Swindon.*)

Use of the 'Gregory box' (CPAP) in treatment of RDS of the newborn: preliminary report. P. M. Dunn, M. J. Thearle, A. C. Parsons, and J. L. Watts (*University of Bristol, Department of Child Health, Southmead Hospital, Bristol.*) Between October 1971 and January 1972, continuous positive airway pressure (CPAP) with the aid of a Gregory box (Gregory *et al.*, 1971) was used by us in the treatment of severe respiratory distress syndrome of the newborn (RDS) on 6 occasions. The apparatus we used to administer CPAP (Dunn *et al.*, 1971) and to monitor and control the pressure is briefly described.

Our early clinical experience may be summarized as follows. 4 infants treated with CPAP improved dramatically. Their mean gestational age was 31 weeks and birth-weight 1930 g. Two of the mothers had had *abruptio placentae*. All developed uncomplicated RDS. Reporting mean values only, treatment was begun at 5 hours when the arterial blood pH was 7.07 and oxygen tension 53 mmHg in 37% oxygen. Starting CPAP with 6 mmHg, while maintaining the ambient oxygen unchanged led to an 89% rise in arterial oxygen tension to 100 mmHg. Treatment was maintained on average for 64 hours (range 46 to 93). All 4 survived.

The remaining 2 infants, both of 34 weeks' gestation, were also born to mothers with *abruptio placentae*. Both developed RDS complicated by polycythaemia and repeated apnoeic attacks. Though both responded to dilution exchange transfusion with plasma and to CPAP, apnoeic attacks continued. One infant required artificial ventilation after 4 hours of CPAP and survived. A second infant, with an initial pH of 6.92, failed to recover from an apnoeic attack after 5 hours of CPAP and necropsy revealed a large intraventricular

haemorrhage. This was the only death from RDS on our service during this short preliminary study though, from previous experience, we would have anticipated at least 4 such deaths in this length of time.

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Experience with a catheter-tip transducer for continuous measurement of blood oxygen tension, including evaluation in 4 newborn babies.

P. Goddard, I. Keith, H. Marcovitch, P. J. Rolfe, and J. W. Scopes. (*Neonatal Research Unit, Institute of Child Health, Hammersmith Hospital, London W.12.*) An intravascular catheter-tip transducer continuously measuring PO_2 has been described previously. This has been modified by replacing the PTFE membrane and catheter by PVC and by employing two concentric catheters to allow for concurrent blood sampling.

It has been used in 4 newborn babies, 3 of whom were preterm and all of whom had signs of respiratory distress syndrome. In 3 treatment included the use of continuous positive airway pressure (CPAP) and in 2 mechanical ventilation became necessary. In the four transducers used, measured PO_2 agreed within 10% with that measured on an arterial sample using an IL 313 Blood Gas Analyser. One functioned for 26 hours; a second lasted 28 hours but there was a step change in calibration at 16 hours; one was functioning normally when removed at 12 hours and the fourth failed at 10 hours.

Findings included that (1) it provided an excellent

minute-by-minute guide to the condition of the infants and was a frequent early warning of subsequent clinical deterioration; (2) on a number of occasions during the performance of radial artery puncture a previously stable PO_2 fell by up to 20 mmHg without change in inspired oxygen concentration; (3) in infants with periodic or irregular respiration, PO_2 tended to vary throughout a range from 40 to 90 mmHg without change in inspired oxygen concentration; (4) during exchange transfusion in one neonate, PO_2 fell with each injection of blood; the faster the injection the greater the fall; and (5) when CPAP was started in 3 neonates with respiratory distress syndrome, PO_2 invariably began to rise immediately. After 2 to 5 minutes irregular respiration regularized, periodic respiration was abolished, apnoeic periods ceased, and respiratory excursion increased. When CPAP was disconnected a fall in PO_2 generally preceded changes in the character of respiration but this was not invariable.

Onset of labour: a paediatrician's view. H. V. Price. (*Department of Child Health, Cardiff.*) The majority of the morbidity and mortality in the newborn period is directly attributable to premature or delayed birth. The 'modern' view as mentioned by Galen is that the fetus initiates labour. The fetal adrenal is thought to contain the trigger mechanism.

Our studies have been undertaken in two ways.

Firstly, indirect evidence is presented from the Cardiff Birth Survey of the length of gestation in relation to anencephaly, spina bifida, hydrocephalus, congenital adrenal hyperplasia, and hypoplasia, and maternal smoking.

Secondly, tetracosactrin stimulation tests were performed on infants with the above complaints, and also on premature, small-for-dates, and normal infants. Findings to date support the concept that fetal adrenal function is concerned with initiating labour.