Measurement of intrathoracic pressure in the newborn. George Russell and Robert Dinwiddie. Department of Child Health, University of Aberdeen.

Changes in intraoesophageal pressure (Poes) have been shown, in subject to certain limitations, to reflect changes in intrapleural pressure (Ppl) in the adult. However, though Poes is widely used in the study of respiratory mechanics in the newborn, the only comparison of Ppl and Poes so far reported has been in a single anencephalic infant (Hustead and Avery, 1964).

Four infants with spontaneous left-sided pneumothorax were studied. The pressure recorded from an oesophageal balloon with known pressure-volume characteristics was compared with the pressure recorded from the pleural drain. The mean oesophageal pressure swing (Δ Poes) in 100 breaths in the 4 babies was 5.9 cm H₂O (SD $\pm$ 1.0), the corresponding value for the intrapleural pressure swing (Δ Ppl) being 5.7 cm H₂O (SD $\pm$ 1.0), giving a mean difference 0.2 cm H₂O. The relation between Δ Poes and Δ Ppl varied between infants, and in the same infant from time to time, but the correlation between the two pressure swings was close ($r = 0.823$, $P < 0.001$), and the regression of Δ Poes on Δ Ppl fell close to the line of identity (Δ Poes = 0.83 , Δ Ppl = 1.12). When absolute pressures were compared, Poes was slightly higher than Ppl.

The effect of posture on Poes is similar to that described in the adult (Ferris, Mead, and Frank, 1959). In the supine position, widely used in the study of respiratory mechanics in the newborn and especially during whole body plethysmography, Poes is substantially more positive than in the upright or lateral position, and does not accurately reflect Ppl.

A comparison of pressure-volume loops using simultaneously measured Poes and Ppl shows that Poes measured in the right lateral position can be used as a satisfactory alternative to Ppl in the measurement of respiratory mechanics.

REFERENCES

- Ferris, B. G., Mead, J., and Frank, N. R. (1959). Effect of body position on oesophageal pressure and measurement of pulmonary compliance. *Journal of Applied Physiology*, **14**, 521.
Hustead, R. F., and Avery, M. E. (1964). Cited by M. E. Avery. In *The Lung and Its Disorders in the Newborn Infant*, p. 51. Saunders, Philadelphia.

2', 3'-cyclic nucleotide 3'-phosphohydrolase in the developing human brain. Neville R. Belton and John M. Anderson introduced by F. Cockburn. Departments of Child Life and Health, and Pathology, University of Edinburgh, Edinburgh.

The activity of 2', 3'-cyclic nucleotide 3'-phosphohydrolase (CNP) has been examined in necropsy samples of brain of newborn infants and young children. At varying times in different areas a rapid increase in CNP activity occurs immediately preceding an increase in cholesterol concentration. In the areas studied these changes are found successively in medulla, internal capsule, occipital white matter, corpus callosum, and frontal white matter, at times which correspond to the histological onset of myelination. The increase in

specific activity of CNP is greater than that of creatine kinase, lactic dehydrogenase, and cholinesterase, and therefore appears to be characteristic of active myelination. This observation supports the subcellular fractionation studies in small vertebrates which have shown that CNP is localized in the myelin sheath or closely related structures such as the oligodendrocyte plasma membrane (Kurihara and Tsukada, 1967; Zanetta *et al.*, 1972).

Because severe undernutrition at the time of active brain growth is recognized to result in a reduction of myelin lipid concentration in experimental animals, CNP activity has been compared in a group of dysmature and normal weight infants at 38 to 42 weeks' gestation. A significant reduction in CNP activity is demonstrable in dysmature infants in 2 nonmyelinated areas, cerebral white matter and cerebral cortex, but not in the actively myelinating internal capsule.

REFERENCES

- Kurihara, T., and Tsukada, Y. (1967). The regional and subcellular distribution of 2', 3'-cyclic nucleotide 3'-phosphohydrolase in the central nervous system. *Journal of Neurochemistry*, **14**, 1167.
Zanetta, J. P., Benda, P., Gombos, G., and Morgan, I. G. (1972). The presence of 2', 3'-cyclic AMP 3'-phosphohydrolase in glial cells in tissue culture. *Journal of Neurochemistry*, **19**, 881.

Plasma tocopherol values in infants and children. W. R. McWhirter, introduced by C. Forsyth. Department of Child Health, University of Dundee, Dundee.

Controlled clinical trial of corticosteroid therapy in prophylaxis of respiratory distress syndrome. H. V. Price. Welsh National School of Medicine, Cardiff.

An attempt has been made at preventing respiratory distress syndrome. Intramuscular hydrocortisone and Depot Synacthen have been given immediately after birth to randomly selected infants.

The babies have been clinically assessed by recording Fulham scores serially. Estimations of plasma cortisol blood glucose, blood gases and thrombotest have also been made.

Chest x-rays were taken when clinically indicated. The encouraging results were presented.

Neonatal cold injury. E. N. Hey introduced by J. M. Parkin. Department of Child Health, University of Newcastle upon Tyne, Newcastle upon Tyne.

Giardiasis and coeliac disease. F. Carswell, A. A. M. Gibson, and T. A. McAllister introduced by W. Hamilton. Departments of Child Health, Pathology and Bacteriology, Royal Hospital for Sick Children, Glasgow. To be published in full in the *Archives*.

Histidinaemia: its significance in neonatal screening. B. G. R. Neville and P. M. Lilly introduced by J. T. Harries. Institute of Child Health, 30 Guilford Street, London.

Histidinaemia is an autosomal recessive condition in which there is a deficiency of histidase and persistently raised blood levels of histidine. Family studies show a wide variation in the clinical picture from complete normality to severe retardation. The association between the biochemical condition and any neurological abnormality could be coincidental. In the present study, infants with raised histidine levels by Guthrie technique were followed without dietary treatment. In the first year 110,000 infants were screened and 10 had persistently raised histidine levels (i.e. incidence 1 in 11,000). The oldest is now 15 months and is within the normal range in all development.

Urinary FDP in children with renal disease.

William Uttley introduced by J. K. Brown. Department of Child Life and Health, University of Edinburgh.

Vassalli and McCluskey (1971) reviewed the current status of coagulation processes and fibrin deposition in the pathogenesis of renal disease.

We have examined a series of 96 patients, one-third of whom were children with a wide spectrum of renal disease, comparing the demonstration of fibrin in renal biopsy specimens using 3 techniques—standard histochemistry, electron microscopy, and immunofluorescence. A good correlation existed between the most reliable of these methods (immunofluorescence) and the estimation of the maximum amount of fibrin/fibrinogen degradation products (FDP) in the urine (Clarkson *et al.*, 1971) before biopsy.

In children, normal values of UFDP have been obtained (0.0–5 µg/ml). Results obtained are in the Table.

Significant amounts of UFDP were also found in patients with urinary tract infection and the haemolytic uraemic syndrome. Illustrative cases were discussed. It was concluded that the urinary excretion of FDP does not support the hypothesis of significant fibrin deposition in nephrosis (Duffy *et al.*, 1970), but reflects periods of episodic coagulation in glomeruli in proliferative nephropathy.

REFERENCES

- Clarkson, A. R., MacDonald, M. K., Petrie, J. J. B., Cash, J. D., and Robson, J. S. (1971). Serum and urinary fibrin/fibrinogen degradation products in glomerulonephritis. *British Medical Journal*, **3**, 447.
- Duffy, J. L., Cinque, T., Grishman, E., and Churg, J. (1970). Intraglomerular fibrin, platelet aggregation and subendothelial deposits in lipid nephrosis. *Journal of Clinical Investigation*, **49**, 251.

Vassalli, P., and McCluskey, R. T. (1971). The pathogenic role of the coagulation process in glomerular diseases of immunologic origin. In *Advances in Nephrology*, Vol. 1, p. 47. Ed. by J. Hamburger, J. Crosmer, and M. H. Maxwell. Year Book Medical Publishers, Chicago.

In vivo effect of adenosine 3', 5'-monophosphate on Ehrlich ascites tumour cells. Mary J. Seller and Philip F. Benson. Paediatric Research Unit, Guy's Hospital Medical School, London SE1 9RT.

In some tumour cells there is diminished activity of adenylyl cyclase. There is evidence which suggests that this causes deficient production of cyclic AMP which in turn results in uninhibited cell division. When tumour cells are cultured *in vitro* the addition of cyclic AMP to the medium restores some of the properties of density dependent inhibition of growth.

We have investigated, the carcinostatic effect of cyclic AMP. 10 million Ehrlich ascites tumour cells were injected either subcutaneously to produce a solid tumour, or intraperitoneally to produce the ascitic form. 3 days later drugs were injected intraperitoneally twice daily for 4.5 days. Two regimens were used. (1) Cyclic AMP 10 mg/kg and theophylline ethylenediamine (TED) 50 mg/kg (cyclic AMP + TED). (2) TED 50 mg/kg. The control group was injected with saline only.

Eight days after receiving tumour cells the cyclic AMP+TED animals had significantly smaller solid tumours than the controls (0.001 > P > 0.01). Those with the ascitic form had significantly fewer ascites cells (548 million) than the controls (1076 million) (P = 0.001), and significantly lower mean packed tumour cell volume (0.001 > P > 0.01). The TED group had intermediate values.

Ascites and abdominal wall infiltration were much less marked in the cyclic AMP+TED animals than in controls. Treatment also produced changes in tumour cell morphology.

It may be concluded that cyclic AMP inhibits growth and tissue invasion of Ehrlich ascites tumour cells in mice.

Organic anions and stool volume in the newborn.

Michael Tarlow and Hazel Thom introduced by G. Russell. Department of Child Health, University of Aberdeen.

The factors controlling stool volume in normal individuals are unknown. A large proportion of stool electrolyte consists of short chain fatty anions (e.g. acetate, lactate, butyrate). These presumably arise in the colon from bacterial fermentation of undigested foodstuffs. Since the colonic wall is relatively imper-

TABLE

Disease	No. of patients	No. of specimens	UFDP (µg/ml)			
			0–0.5	0.5–1	1–2	> 2
Nephrosis	14	143	123	14	4	2
Henoch-Schönlein purpura	16	77	70	5	1	1
Other forms of proliferative glomerulonephritis	19	129	83	23	12	11