SUMMARY

Haemadsorption followed by acridine-orange staining detects infection with influenza A virus of various tissues from 10- to 11-day chick embryos. Using tissue cultures of squashed organs on polythene, it can be demonstrated that a cell which does not show any obvious cytopathic effect is infected with virus, for the phenomenon can be specifically neutralized by immune serum. The antibody content of an immune serum can be titrated using haemadsorption-inhibition as the indicator.

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Medical Memoranda

Induced Hypothermia in Obstetric Shock

The following case is recorded to demonstrate how induced hypothermia may occasionally have a place in the treatment of obstetric shock.

CASE REPORT

An emergency lower-segment caesarean section was performed on a healthy 21-year-old 2-para with placenta praevia (type 3) at 34 weeks. Anaesthesia, induced with 300 mg. of 2.5% thiopentone and 15 mg. of tubocurarine, was maintained with N₂O, O₂, and "trilene" (trichlorethylene) via a cuffed endotracheal tube. The surgical manipulations were straightforward, and after intravenous ergometrine the uterus became firmly contracted and retracted.

Soon after the vaginal examination, which immediately preceded laparotomy, the patient became cyanosed and her blood-pressure fell, becoming unrecordable at the end of the operation. The rate of blood transfusion, started before operation, was increased, and by the end of the operation 4 pints (2.3 litres) had been given, 4 mg. of noradrenaline having been added to the last pint (570 ml.). The maximal blood loss was estimated at 2 pints (1,140 ml.).

In the immediate post-operative period cyanosis was marked and did not respond to ventilation with 100% oxygen. The blood-pressure continued unrecordable and loud moist rales were heard all over the chest. To combat restlessness, paraldehyde 5 ml. was given intramuscularly. Pending results from blood-volume studies, the transfusion was maintained with 5% glucose in normal saline. Hydrocortisone 100 mg., given intravenously on an empirical basis, was followed by some improvement, the systolic blood-pressure returning to 95 mm. Hg. A further 100 mg. of hydrocortisone was added to the infusion bottle.

Deterioration, however, continued. Two hours after delivery she was restless and cyanosed, the lung fields were still moist, the unsupported systolic blood-pressure was 60 mm. Hg, and signs of cerebral irritation were becoming evident. Investigations revealed haemoglobin 10.3 g./100 ml., P.C.V. 36%, blood-volume (Evans-blue dilution technique) 74 ml./kg., serum sodium 135 mEq/l., serum chloride 102 mEq/l., serum potassium 3.4 mEq/l.

Hypothermia was induced in order to reduce the ill-effects of progressive hypoxia. The patient was exposed to a draught of cold air, and ice-bags were positioned over the abdomen, chest, and groins. A mixture of chlorpromazine 50 mg.,

pethidine 100 mg., and water to 6 ml. was injected intravenously in three divided doses over 30 to 45 minutes. The oesophageal temperature, measured by an electric thermometer, was taken down to 32° C. and maintained about this level. A noradrenaline-in-saline infusion was adjusted to maintain the systolic blood-pressure between 90 and 100 mm. Hg. Paraldehyde 5 ml. was injected intramuscularly as necessary to allay restlessness.

The cyanosis lessened as cooling proceeded. Four hours after refrigeration was started the patient's general condition was much improved, and she appeared to be sleeping peacefully. Twenty-four hours after operation the unsupported systolic blood-pressure was stable at 100 mm. Hg, cyanosis had cleared, and the general condition was good. Hypothermia was therefore discontinued by removing the ice-packs, and slow rewarming was begun. Thirty hours after the operation the patient was awake, lucid, and fully compos mentis. The blood-pressure was 115/75 mm. Hg, pulse 84, respiration rate 26, and temperature 37° C. Thereafter progress was satisfactory. The puerperium was apyrexial, and urine output and constituents were normal. On the third post-operative day she coughed copious amounts of frothy sputum. Repeated laboratory examinations of the latter revealed no eosinophilic squames. E.C.G. recordings and a chest film taken on the eighth day showed no abnormalities. She was discharged home fit and well 10 days after operation. The baby, a male weighing 4 lb. 8 oz. (2,036 g.) at birth, made straightforward progress on artificial-milk feeds.

DISCUSSION

The triad of arterial hypotension, pulmonary oedema, and oxygen-resistant cyanosis ensuing in the supine position soon after placenta praevia is palpated per vaginam in the lithotomy position, suggests air embolism, as there is a tendency for large veins at the placental site to be opened up and a venaful of air to escape into the circulation (Nelson, 1960). A chest x-ray film taken at the time might have confirmed the diagnosis (Taylor, 1952), in which case needle-aspiration of the right-sided chambers of the heart would seem indicated (Stallworthy *et al.*, 1950).

It is unlikely that liquor amnii embolism did occur, as the patient was not in labour, there were no evident amniotic membrane fenestrations, there was no associated coagulation deficiency, and repeated examination of the sputum revealed no eosinophilic squames. Blood-volume estimation outruled haemorrhagic (hypovolaemic) shock. Acute adrenocortical failure can mimic the picture (O'Sullivan, 1954), but though improvement followed intravenous cortisone it is noted that the serum sodium and potassium levels at the time were normal. Mendelson's (1946) syndrome was not considered, as no reflux of gastric contents occurred.

Hypothermia acts by depressing intracellular metabolic processes, thus safeguarding vital organs from possible irreversible damage from hypoxia. It therefore constitutes a useful though rarely required adjunct to orthodox resuscitative measures (Murray and Bruce, 1955).

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