Management of Severe Ovarian Hyperstimulation

A. J. TYACK, J. D. ELLIS

British Medical Journal, 1971, 2, 263

The ovarian hyperstimulation syndrome is a serious and sometimes fatal complication of human gonadotrophin therapy. Most reports have been concerned with avoiding this risk. Management of the established condition has been less often discussed. A case of ovarian hyperstimulation resulting from treatment with human menopausal gonadotrophin (HMG) and human chorionic gonadotrophin (HCG) is described here.

Case Report

The patient was a healthy nulliparous 27-year-old woman with five years' secondary amenorrhoea. Investigation of both partners was normal except that a vaginal smear showed no cornified cells, her total gonadotrophins were 1.5 IU/24 hours (2nd International Reference Preparation) and baseline oestrogens were 5 µg/24 hours. Clomiphene previously had produced periods but not pregnancy or evidence of ovulation.

Progress chart.

Area Department of Obstetrics and Gynaecology, Churchill Hospital, Oxford

A. J. TYACK, M.B., M.R.C.O.G., Registrar

J. D. ELLIS, F.R.C.S., M.R.C.O.G., Consultant Obstetrician and Gynaecologist

Treatment consisted of 375 IU of human menopausal gonadotrophin on three alternate days, with 10,000 units of human chorionic gonadotrophin given on the eighth day despite daily urinary oestrogen levels which had risen thus: 29, 35, 75, 134, 264, 460, and 800 µg on the day before administration of human chorionic gonadotrophin. One week later she was admitted to hospital with nausea, lower abdominal pain, and oliguria for two days. The pulse was 108, blood pressure 80/50, the legs were oedematous, and the extremities were cold and blue. The lower abdomen was very tender and distended. Both ovaries were enlarged to the umbilicus and there was ascites. Packed cell volume was 58%, haemoglobin 18.6 g/100 ml, and plasma urea 39 mg/100 ml. Electrolytes, urine, and chest x-ray appearances were normal. After 500 ml of normal saline and 1,000 ml of 6% dextran solution (Macrodex) intravenously her blood pressure was 110/80, pulse 80, P.C.V. 42%, and haemoglobin 12.1 g/100 ml.

Over the next six days her condition deteriorated, with increasing abdominal pain and distension with ileus and increasing oedema, especially of the legs and lower trunk. Despite apparently adequate intravenous fluids the blood pressure fell to 95/60, the pulse rose to 120, and the extremities again became cold and blue. There were no lung crepitations or signs of pleural effusion. She became oliguric, with urine osmolality rising to 1,190 mOsm/kg. Plasma electrolytes remained normal and plasma urea did not exceed 39 mg/100 ml.

Six days after admission the plasma albumin was 2.4 g/100 ml. She was given 400 ml of double-strength plasma followed by 225 g of human albumin. Abdominal paracentesis produced 12 litres of blood-stained fluid containing 520 g of protein (see Chart).

After administration of human albumin and abdominal paracentesis she improved remarkably. Plasma albumin increased to 3.9 g/100 ml, there was a diuresis of 5,650 ml within 72 hours, and oedema and ileus cleared. The ovaries decreased rapidly in size and were not palpable abdominally on discharge 17 days after admission. The clotting time was normal throughout.

Comment

Treatment of this condition is afforded scanty mention in the literature. Emphasis has been on restoring the plasma volume to normal with liberal intravenous fluids, mannitol, and dextrans, with heparinization to prevent thrombosis (Mozes *et al.*, 1965; Neuwirth *et al.*, 1965; Crooke, 1970). We can trace one reference to hypoproteinaemia (Neuwirth *et al.*, 1965) and none to hypoalbuminaemia.

The pathological changes in the hyperstimulation syndrome are explicable on the basis of protein (in particular, albumin) shifting from the plasma to the peritoneal cavity. A dangerous downward spiral of hypovolaemia, haemoconcentration, and circulatory failure ensues with the attendant risks of thrombosis and renal failure. This process can be interrupted by increasing the plasma colloid osmotic pressure with human albumin and by removing protein from the peritoneal cavity by paracentesis. This view of possible mechanism is supported by our patient's dramatic improvement at a stage in the illness when, on published evidence (Lunenfeld and Rabau, 1967; Crooke, 1970), improvement was not to be expected for a further five to seven days.

Prophylactic anticoagulation was not undertaken as the clotting time was normal and evidence of intraperitoneal haemorrhage was confirmed on paracentesis.

References

- Crooke, A. C. (1970). *British Medical Bulletin*, 26, 1, 17.
- Lunenfeld, B., and Rabau, E. (1967). In *Proceedings of V World Congress on Gynaecology and Obstetrics*, Sidney, ed. C. Wood, p. 294. Sidney, Butterworth.
- Mozes, M., *et al.* (1965). *Lancet*, 2, 1213.
- Neuwirth, R. S., Turksay, R. N., and Vande Wiele, R. L. (1965). *American Journal of Obstetrics and Gynecology*, 91, 977.