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Persistent hyponatraemia complicating fibrosing alveolitis

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Two patients with fibrosing alveolitis, one associated with rheumatoid disease, the other cryptogenic, developed persistent hyponatraemia consistent with the syndrome of inappropriate secretion of antidiuretic hormone (SIADH); this association has not previously been described.

Case reports

PATIENT 1

A previously healthy 70-year-old housewife presented with dry cough and dyspnoea. She had finger clubbing, was dyspnoeic at rest, and had basal crackles. A chest radiograph showed bilateral reticulonodular shadowing. Spirometry showed a restrictive picture; transfer factor was very low at 3·55 ml/min/mm Hg (1·19 mmol min^{-1} kPa^{-1}). Pa_{O_2} at rest was 55 mm Hg (7·32 kPa), Pa_{CO_2} 40 mm Hg (5·32 kPa). Aspergillus precipitins were absent as were antinuclear antibodies. The result of a Mantoux test was negative. Sputum cytology showed no atypical cells.

Cryptogenic fibrosing alveolitis was diagnosed, and the patient started taking oral prednisolone, 10 mg daily. She was admitted to hospital four months later with increasing dyspnoea, which had been treated by her general practitioner with a thiazide diuretic. Her physical findings and chest radiograph were unchanged, and she was apyrexial; her serum sodium was 134 mmol/l. Her sputum contained *Haemophilus influenzae* sensitive to amoxycillin, with which she was treated, but three days later she became confused and drowsy; serum sodium was 113 mmol/l, plasma osmolality 247 mmol/kg, and simultaneous urine osmolality 606 mmol/kg. SIADH was diagnosed, her diuretic was stopped and her fluid intake restricted to 600 ml daily. Fludrocortisone 0·3 mg daily was started on day 7 and her fluid intake further restricted, to 400 ml, on day 11 (fig 1). She was discharged 38 days after admission. Her electrolytes, creatinine clearance, and thyroid function were normal when checked in clinic.

She was readmitted three months later with mild cardiac failure for which she was taking frusemide. Chest radiography showed a small pneumothorax, which was treated by suction drainage; her serum sodium was 117 mmol/l. This returned to normal on fluid restriction alone (fig 1). She was admitted again two months later with pneumonia, which proved fatal; during this final illness her electrolytes remained normal. Necropsy was not performed.

PATIENT 2

A 59-year-old housewife with longstanding rheumatoid arthritis and pulmonary fibrosis was admitted with increasing dyspnoea. She was taking

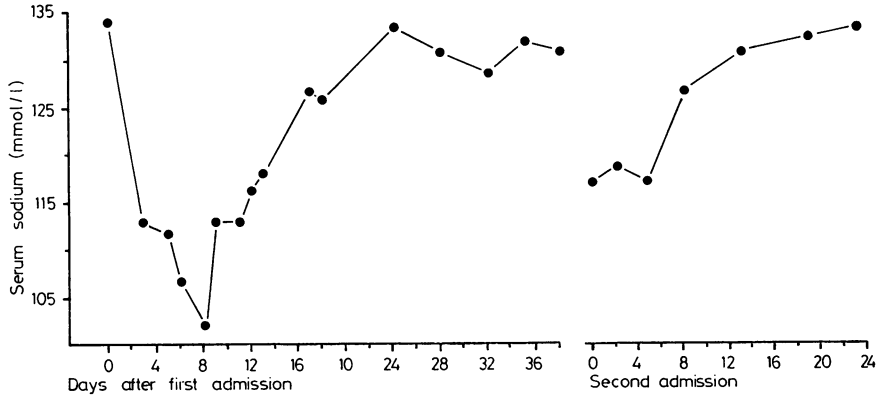

Fig 1 *Serum sodium concentrations in patient 1 during two admissions.*

prednisolone 5 mg daily and a thiazide diuretic. She was dyspnoeic, with widespread pulmonary crackles; she had no finger clubbing and was clinically euthyroid. Serum sodium was 130 mmol/l, Rose-Waaler titre 1/64, and results of a Synacthen stimulation test and creatinine clearance were normal. A chest radiograph showed diffuse pulmonary fibrosis. Spirometry showed a restrictive picture; transfer factor was grossly reduced at 2·5 ml/min/mm Hg (0·74 mmol min^{-1} kPa^{-1}). Pao_2 was 80 mm Hg (10·64 kPa) and $Paco_2$ 33 mm Hg (4·34 kPa). The result of a Mantoux test was negative.

She was discharged on an increased steroid dosage but was readmitted six weeks later with general deterioration. Radiographic and clinical findings were unchanged, and she was apyrexial. Serum sodium was found to be 115 mmol/l, plasma osmolality 222 mmol/kg, and simultaneous urine osmolality 406 mmol/kg. Her diuretic was stopped, and she was treated with fluid restriction and fludrocortisone; initial biochemical improvement was not maintained (fig 2), and she died five weeks after admission. Necropsy showed terminal bronchopneumonia with no evidence of tuberculosis or malignant disease.

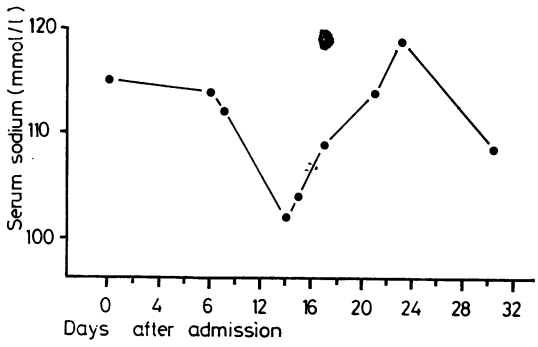

Fig 2 *Serum sodium concentrations in patient 2.*

Discussion

Both these patients developed SIADH according to criteria laid down by Bartter and Schwartz (1967)—hyponatraemia with reduced plasma osmolality, urine hypertonic to plasma, absence of clinical oedema or dehydration, and normal renal and adrenal function. The syndrome was first recognised in 1957 in a patient with bronchial carcinoma (Schwartz *et al*, 1957) and has subsequently been described in association with a wide variety of conditions (Bisset and Jones, 1957). There seems to be no single underlying mechanism; synthesis of an ADH analogue by tumour tissue has been shown in some cases, and in one case of tuberculosis the affected lung tissue was shown to contain a substance with antidiuretic activity. In SIADH associated with neurological disorders it is assumed that local damage leads to release of ADH from the hypothalamus. Various drugs may cause SIADH by stimulating hypothalamic ADH release or by sensitising the renal tubule to the action of ADH already in circulation; chronic diuretic treatment may lead to ADH release in response to hypovolaemia, and in some cases may lead to resetting of the "osmostat" at a lower than normal concentration of plasma osmolality (Ghose, 1977). Various pulmonary disturbances can lead to SIADH; Rosenow *et al* (1972) have suggested that the common factor may be hypoxia, leading to pulmonary vasoconstriction, decreased left atrial filling, and hence to reflex hypothalamic ADH release. SIADH has not previously been described in association with fibrosing alveolitis; in our two cases it was presumed to be due to exacerbations of chronic hypoxia, possibly potentiated by intermittent diuretic treatment.

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References

Bartter, F, and Schwartz, W (1967). The syndrome of inappropriate secretion of antidiuretic hormone. *American Journal of Medicine*, **42**, 790–806.

Bisset, G, and Jones, N (1975). Antidiuretic hormone in *Recent Advances in Renal Disease 1*, edited by N F Jones. Churchill Livingstone, Edinburgh.

Ghose, R (1977). Reset osmostat after diuretic treatment. *British Medical Journal*, **2**, 1063.

Rosenow, E, Segar, W, and Zehr, J (1972). Inappropriate ADH secretion in pneumonia. *Mayo Clinic Proceedings*, **47**, 169–174.

Schwartz, W, Bennett, W, Curelop, S, and Bartter, F (1957). A syndrome of renal sodium loss and hyponatremia probably resulting from inappropriate secretion of antidiuretic hormone. *American Journal of Medicine*, **23**, 529–542.

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