An ECG confirmed the presence of sinus bradycardia in all three patients; the deterioration in their general health consisted of withdrawal, listlessness, refusal of food, and general apathy. The pulse reverted to normal and the symptoms disappeared within two days of ending the drug.

Discussion

Hydergine contains 1.5 mg of mesylates of dihydrogenated alkaloids of dihydroergokryptine. The substance is thought to have a profound alpha-blocking action. It has also been suggested that it may have beta-adrenergic blocking effects.⁴ The bradycardiac effect of Hydergine is mentioned in earlier European literature particularly in relation to the use of Hydergine in peripheral vascular disease, but we have been unable to find a mention in the more recent literature in this country referring to its use in cerebrovascular insufficiency. Further research into the action of Hydergine on the heart rate would be of interest. We feel the development of this complication in three out of eight patients treated with Hydergine associated with severe systemic symptoms is of sufficient importance to report these cases.

We thank Mrs J Newman, SRN, and Mrs P Southward, SRN, for helping with the running of the trial.

¹ Rehman, S A, *Current Medical Research and Opinion*, 1973, 1, 8.

² McConnachie, R W, *Current Medical Research and Opinion*, 1973, 1, 8.

³ Gedye, J C, in *Aspects of Educational Technology 1; the Proceedings of the Programmed Learning Conference*, held at Loughborough, 15-18 April 1966, ed D Unwin and J Needham, p 369. London, Methuen, 1967.

⁴ *Pharmacological Basis of Therapeutics*, ed L S Goodman and A Gilman, 4th edn. New York, Macmillan, 1970.

Department of Geriatrics, Middlesex Hospital, London W1N 8AA

A C DCAYLEY, MB, MRCP, senior registrar
A MACPHERSON, MB, MRCP, research assistant
J WEDGWOOD, MD, FRCP, consultant in geriatric medicine

SLE precipitated by antibodies in a patient with Sjögren's syndrome and rheumatoid arthritis

Typical rheumatoid arthritis and systemic lupus erythematosus (SLE) are often considered as separate diseases with different prognoses and treatments. Sjögren's syndrome has been reported in association with both diseases.¹ It has been suggested, however, that SLE and rheumatoid arthritis may well represent opposite ends of a spectrum of connective tissue diseases and that overlap cases combining features of both diseases may occur.² This latter concept is illustrated by the patient reported here, in whom a disease with the typical, clinical, and serological features of SLE was precipitated by antibiotics on two occasions but who had otherwise typical rheumatoid arthritis with Sjögren's syndrome in the intervening period.

Case History

Mrs AB, aged 42 in April 1973, developed polyarthritis, fever and a chest infection two weeks after treatment for a sore throat with a 12 day course of co-trimoxazole. She had a history of respiratory tuberculosis treated with chemotherapy in 1961, while her mother had had Sjögren's syndrome and rheumatoid arthritis. After further treatment elsewhere with co-trimoxazole and rifampicin, ethambutol, and isoniazid she became ill with worsening of her polyarthritis and pericarditis. LE cells were seen in the blood film; the titre of serum antinuclear factor was 1/1000, and that of rheumatoid factor 1/256, while DNA binding 28% (borderline abnormal). SLE was diagnosed, all therapy stopped, and high dose prednisolone started. She improved clinically and steroids were tailed off. During follow-up over the next year at the Centre for Rheumatic Diseases she developed symptomatic Sjögren's syndrome with typical ocular and oral manifestations. She continued to have intermittent peripheral joint pain and stiffness and developed synovial hypertrophy of the metacarpophalangeal and proximal interphalangeal joints of the hands and x-ray changes of periarticular osteoporosis and juxta-articular erosions.

She was managed with non-steroidal anti-inflammatory drugs and by December 1974 her serum antinuclear factor had become negative, DNA binding 0%, and the titre of rheumatoid factor 1/1025. She remained generally well otherwise until April 1975, when she again was treated with co-trimoxazole at home for a sore throat. After this she remained generally unwell for a month until she was admitted to hospital in May with fever and signs of a left basal pneumonia. She was then treated with co-trimoxazole initially and rapidly became worse with confusion, pyrexia, and extreme weakness. Laboratory tests showed DNA binding of 60% with an antinuclear factor titre of 1/1000, complement C3 160% (normal 75-150%), complement C4 69% (normal 31-55%). Co-trimoxazole was stopped and she was again treated with high dose steroids and improved clinically in parallel with a change in her abnormal serological indices.

Discussion

This patient developed the multi-system features of SLE on two occasions after the administration of antibiotics, including co-trimoxazole. Sulphonamides, like penicillin, have been reported to precipitate SLE in those predisposed,³ and it seems likely that they, rather than the trimethoprim component of co-trimoxazole, were responsible in this case. Antibodies to native DNA⁴ were demonstrated during this patient's second illness and, as they are not usually found in drug-induced SLE⁵ their presence in the patient may represent true SLE activated in a susceptible patient by drugs.

This case history emphasises the care that must be taken in considering giving antibiotics not only to patients with a previous history of SLE but also to those known to have Sjögren's syndrome. It also supports the present concept that SLE and rheumatoid arthritis exist as different poles of a spectrum of disorders, with patients with Sjögren's disease perhaps occupying an intermediate position. We think that further studies of patients like ours with similar overlap syndromes might give a greater understanding of the various disease processes concerned.

¹ Whaley, K, *et al*, *Quarterly Journal of Medicine*, 1973, 167, 513.

² Dubois, E L, in *Lupus Erythematosus*, p 471, 2nd edn. Los Angeles, University of South California Press, 1974.

³ Gould, S, *Lancet*, 1951, 2, 268.

⁴ Hughes, G R V, *Lancet*, 1971, 2, 861.

⁵ Harpey, J P, *Adverse Drug Reaction Bulletin*, 1973, 43, 140.

The Centre for Rheumatic Diseases and University Department of Medicine, Royal Infirmary, Glasgow

D M GRENNAN, MB, MRCP, medical registrar
G BELL, MB, CHB, house officer
P J ROONEY, MB, MRCP, senior medical registrar
A C KENNEDY, MB, MRCP, senior medical registrar

Acute rhabdomyolysis and acute renal failure after intravenous self-administration of peanut oil

Nontraumatic rhabdomyolysis with myoglobinuria may cause acute renal failure (ARF). Several agents may initiate rhabdomyolysis and another one is reported.

Case Report

A 27-year-old labourer was admitted to hospital unconscious. During the preceding 12 hours he had taken alcohol, cannabis, nitrazepam, Palfium (dextromoramide), and cocaine in unknown quantities and methadone by intravenous injection. In addition he had injected into his veins the contents of ten Hemineurin capsules. Each capsule contained 192 mg of chlor-methiazole base and 384 mg of peanut oil. He was drowsy and complained of severe pain in the lower back and legs. The thighs and buttocks were appreciably swollen, painful, and tense, and there was a flaccid paraplegia with loss of pain and tactile sensation below L2 with sacral sparing. Vibration sense was absent in the legs.

The results of investigations showed: plasma sodium 130 mmol/l (130 mEq/l); potassium 6.8 mmol/l (6.8 mEq/l); creatinine 274 μ mol/l (3.1 mg/100 ml); urea 3.8 mmol/l (23 mg/100 ml); haemoglobin 18.5 g/dl; white cell count $19 \times 10^9/l$ (19 000/mm³); serum creatine phosphokinase (CKP) 5 000 IU; serum aldolase 182 Sibley Lehninger units/ml; serum glutamic oxaloacetic transaminase (SGOT) 3 330 IU; hepatitis associated antigen positive. Because of the latter muscle and renal biopsies were not done. A skeletal survey and intravenous urogram were normal.

Over the first 24 hours he passed 900 ml of dark brown urine. This reacted positively for haem (orthotolidine reaction—Labstix), but contained no red cells or casts. The next day spectrophotometric examination of the urine (pH6) for myoglobin was negative. He developed hypercatabolic ARF requiring peritoneal dialysis. The patient remained oliguric for 15 days and then experienced a profound diuresis with a weight loss of 20 kg. During this period the urinary sodium excretion was 300–400 mmol/24h; potassium excretion 100–150 mmol/24h; calcium excretion 20–22.5 mmol/24h (800–900 mg/24 h); serum calcium 3.1 mmol/l (12.3 mg/100 ml); serum phosphorus 3.0 mmol/l (9.4 mg/100 ml); and serum alkaline phosphatase 65 IU. The swelling and tenderness of his legs resolved leaving severe global wasting. Ten weeks later all biochemical values were normal. The paraplegia recovered completely.

Discussion

It is suggested that the intravenous administration of peanut oil resulted in acute rhabdomyolysis with myoglobinuria and complicating acute oliguric renal failure. There is little information about the toxicology of intravenously administered peanut oil, but chlormethiazole (as the ethane disulphate salt) has been used extensively intravenously without the adverse effects described in this case (Astra Pharmaceuticals, personal communication).

The considerably raised CPK level and the raised plasma potassium and creatinine concentrations, together with a normal blood urea level and orthotolidine-positive urine are strong circumstantial evidence of acute rhabdomyolysis. Myoglobin is most reliably identified by acrylamide gel electrophoresis or immunoassay. Spectrophotometry is less reliable, for in the presence of acid urine, as in this case, the spectral pattern of myoglobin may be altered beyond recognition.¹ The hypercalcaemia and hypercalciuria during the diuretic phase of acute renal failure occur almost exclusively in patients with associated rhabdomyolysis.² No explanation can be given for why the legs were preferentially involved.

¹ Grossman, R A, *et al*, *New England Journal of Medicine*, 1974, **291**, 807.

² Leonard, C D, and Eichner, E R, *Journal of the American Medical Association*, 1970, **211**, 1539.

Department of Renal Medicine, Christchurch Hospital, Christchurch, New Zealand.

K L LYNN, MB, CHB, Registrar

Case of salt overdose

Salt overdose occurs occasionally from misuse of saline emetics.^{1,2} It has also been reported after intrauterine instillation of hypertonic saline for abortion.³ I have been unable to find a reported case of salt overdose in an adult in which the patient survived.

Case Report

A 54-year-old woman was admitted to hospital deeply unconscious at 3 pm, having eaten some salt 21 hours previously to make herself vomit some vegetable which she believed would harm her. She had a history of psychiatric illness and had had a nephrectomy for hydronephrosis one year before. Her blood pressure was 90/60 mm Hg. She had blisters on both knees and the right hand similar to those seen in barbiturate overdose. Serum electrolyte levels were: sodium >160 mmol (mEq)/l, postassium 3.1 mmol/l, chloride >130 mmol/l, bicarbonate 14.8 mmol/l, osmolality 383 mmol (mosmol)/kg. Calculated sodium and chloride were about 185 mmol/l and 150 mmol/l respectively. Blood urea was 9.3 mmol/l (56 mg/100 ml).

Treatment began at 5.30 pm with frusemide and dextrose given as fast as possible by intravenous infusion. Serum osmolality fell fast (see graph). By 9 am next day serum electrolytes were: sodium 137 mmol/l,

Fall in serum osmolality after start of treatment in a case of salt overdose.

potassium 3.8 mmol/l, chloride 107 mmol/l, bicarbonate 16 mmol/l. Urea was 5.6 mmol/l (34 mg/100 ml). A metabolic acidosis, noted in other reported cases, responded to intravenous bicarbonate. Generalised convulsions, which began during treatment, continued for two days despite high intravenous doses of anticonvulsants. The CSF pressure was too high to be safely recorded. CSF protein was 1.65 g/l. The convulsions ceased after 48 hours and consciousness returned over the course of a month. Nevertheless, the patient remained severely mentally handicapped. The CSF at one and two months after admission was normal in pressure and contents.

Discussion

Conventional teaching on the treatment of hyperosmolar states emphasises the importance of a slow reduction in extracellular fluid (ECF) tonicity. This is based on the knowledge that convulsions occur in children with hyperosmolar dehydration due to diarrhoea who are rehydrated rapidly. The fall in tonicity of the ECF with rehydration leads to a relative hypertonicity of the intracellular fluid.¹ Water passes into the cells leading to cellular overhydration. There is a similar increase in CSF volume, and this, with brain cell overhydration, explains the abnormal lumbar puncture results in our patient. The initial physiological change after salt ingestion, however, is a shift of water from cells to the ECF and similarly a reduction in CSF volume. Finberg⁵ has shown this in animals and also that the passage of sodium into the cells is a slower process beginning at least a few hours later.

Post-mortem examination of these patients invariably shows bleeding within the brain or meninges. This results from the shearing stresses applied to vessels when the CSF and brain volume are reduced, which begins within a few hours of ingestion of the salt. The extent of these pathological changes largely determines the outcome of the case. The logical treatment in salt overdosage is therefore an immediate and rapid lowering of serum sodium, and in our case this was achieved by high speed dextrose infusion with intravenous frusemide. Peritoneal dialysis is a much slower method.^{1,2}

In children with hypernatraemic dehydration the serum osmolality may be reduced more slowly when the disturbance in metabolism is more gradual and osmotic equilibration has been achieved without brain damage. The brain damage in our patient was probably due to delay in starting treatment rather than the result of it.

I thank Dr J L Thirkettle for permission to report the case of this patient under his care, and Dr J N Mickerson for his constructive criticisms.

¹ Roberts, C J C, and Noakes, M J, *Postgraduate Medical Journal*, 1974, **50**, 513.

² Lawrence, B H, and Hopkins, B E, *Medical Journal of Australia*, 1969, **1**, 1301.

³ Cameron, J M, and Dayan, A D, *British Medical Journal*, 1966, **1**, 1010.

⁴ McDowell, M E, Wolf, A V, and Steel, A, *American Journal of Physiology*, 1955, **180**, 545.

⁵ Finberg, L, Luttrell, C, and Redd, H, *American Journal of Pediatrics*, 1959, **23**, 46.

St Richard's Hospital, Chichester, Sussex

R C M MCGOURAN, MB, MRCP, medical registrar