athetosis[4] and may occur in psychological illnesses, especially hysteria, and with drugs such as phenothiazines and levodopa.[5] This report adds amodiaquine to the list. Involuntary movements after taking phenothiazines have been attributed to toxic overdose or to individual idiosyncrasy. The doses of amodiaquine in our cases were large but not large enough to be toxic. The patients' reactions were therefore probably idiosyncratic. The rarity of such cases supports this view.

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[1] Glickman, F S, Shatin, H, and Canizares, O, *New York Medical Journal*, 1959, **59**, 3946.
[2] Ormrod, J N, *British Medical Journal*, 1962, **1**, 918.
[3] Kennedy, A F, *British Medical Journal*, 1955, **2**, 475.
[4] Bannister, R, *Brain's Clinical Neurology*, 3rd edn, pp 67, 245. Oxford, Oxford University Press, 1969.
[5] Sergeant, W, Slatter, E, and Kelly, D, *An Introduction to Physical Methods of Treatment in Psychiatry*, 5th edn, p 25. London, Churchill Livingstone, 1972.

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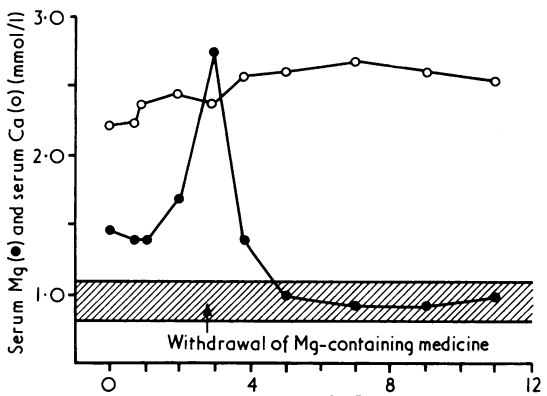
Iatrogenic magnesium intoxication during 1-α- hydroxycholecalciferol treatment

During a therapeutic trial with 1-α-hydroxycholecaliferol (1-α-OHD_3) in chronic renal failure one of our patients became seriously ill because of magnesium intoxication. We therefore want to draw attention to the special risk of magnesium intoxication in patients with chronic renal failure treated with 1-α-OHD_3.

Case report

The patient was a 43-year-old woman with long-standing severe chronic pyelonephritis. The glomerular filtration rate (GFR) was 5 ml/min during the period of treatment with 1-α-OHD_3. Serum magnesium and calcium values are shown in the figure. During treatment with 1-α-OHD_3 (1 μg/day by mouth) the serum calcium concentration began to rise slowly until a maximum was reached after eight weeks' treatment. Before the start of treatment the serum magnesium concentration was moderately increased.



Serum calcium and magnesium values during treatment with 1-α-OHD_3. Shaded area represents normal range of serum magnesium values.

Conversion: SI to traditional units—Magnesium: 1 mmol/l ≈ 2·4 mg/100 ml. Calcium: 1 mmol/l ≈ 4 mg/100 ml.

About two weeks later the patient became exhausted and confused and developed muscle weakness and tremor, and there was an abrupt increase in the serum magnesium concentration. The patient was thoroughly questioned about her medicine intake, and she revealed that for many years she had regularly taken a magnesium-containing antacid powder recommended by a healer. All magnesium-containing medicines were withheld, and the serum magnesium levels returned to normal during the following week, when the symptoms of intoxication disappeared. The 1-α-OHD_3 treatment was continued unchanged.

Discussion

Patients with chronic renal failure tend to retain magnesium.[1] This patient who had regularly taken magnesium-containing medicine had never shown any signs of intoxication, although she had had the same low GFR for a long time. The treatment with 1-α-OHD_3 no doubt contributed to the severe hypermagnesaemia with magnesium intoxication. The increase in serum magnesium concentrations was probably due to an increased intestinal absorption of magnesium similar to the effect of 1-α-OHD_3 on the intestinal absorption of calcium.[2] Magnesium intoxication may likewise be provoked by other Vitamin-D metabolites—for example, 1, 25-dihydroxycholecalciferol and 25-hydroxycholecalciferol—both of which, together with 1-α-OHD_3, are gaining popularity as drugs for treatment and prophylaxis of renal bone disease.

We find it advisable to control serum magnesium values before the start of treatment with 1-α-OHD_3. High values may indicate an intake of magnesium-containing medicine. If general symptoms of magnesium intoxication occur during treatment with 1-α-OHD_3 serum magnesium as well as serum calcium should be controlled.

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[1] Contiguglia, S R, *et al*, *Lancet*, 1972, **1**, 1300.
[2] Catto, G R D, *et al*, *British Medical Journal*, 1975, **1**, 12.

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Subclinical coeliac disease and infertility

Three women under the care of one of us (RW), who had been investigated for infertility, were found to be suffering from coeliac disease. One patient had a healthy baby after treatment with a gluten-free diet. We were impressed by the lack of symptoms in another patient and the mild gastrointestinal symptoms in the other two when they presented with infertility, and we therefore decided to screen a group of women attending an infertility clinic for coeliac disease.

Patients, methods, and results

Seventy-seven women with primary or secondary infertility without overt disease were screened for coeliac disease, using a questionnaire, measurement of the haemoglobin concentration, and examination of a blood film for Howell-Jolly bodies; tests were also done for red cell folate and reticulin antibody.[1] Jejunal biopsy was performed if a screening test proved positive.

Details of the nine patients selected for jejunal biopsy are given in the table. The patient with subtotal villous atrophy had had anaemia and spells of diarrhoea as a child, but had been completely asymptomatic since she was 12. She became pregnant with twins after clomiphene treatment at the time

of the study, and later in pregnancy had overt symptoms with malaise and steatorrhoea of 11·5 g/24 h. She was started on a gluten-free diet and this was succeeded by a dramatic clinical response. Four months postpartum she was challenged with a normal diet for two weeks, and the jejunal biopsy taken at the end of that period showed a severe degree of villous atrophy typical of coeliac disease.

Case No.	Previous bowel disturbance	Haemoglobin (g/dl)	Red cell folate (g/l) (normal > 1·6)	Reticulin antibody	Jejunal biopsy findings
1	−	13	2·50	+	PVA
2	−	13·7	1·46	−	Normal
3	−	14·8	3·15	+	Normal
4	+	12·9	2·50	+	Normal
5	−	NT	1·35	−	Normal
6	+	11	1·80	+	SVA
7	−	13·7	1·30	+	Normal
8	+	13·8	1·53	−	Refused
9	−	14·5	2·85	+	Normal
10	−	10·7	1·60	−	Normal

NT = not tested. PVA = partial villous atrophy. SVA = subtotal villous atrophy.

The other patient with abnormal histological findings originally came from India, although she had been in the UK for nine years. There was no history of bowel disturbance, but the patient was very thin (44 kg, 165 cm). She has been treated with a gluten-free diet for four months, but a repeat intestinal biopsy did not show any significant changes. So far she has not gained weight or conceived.

Discussion

Infertility[2] and recurrent abortions[3] are recognised complications of untreated coeliac disease, and after treatment with a gluten-free diet successful pregnancy may occur. One of our patients with villous atrophy (case 6) undoubtedly had coeliac disease and shows how this condition may be entirely subclinical. The diagnosis of coeliac disease was not established in the second patient with partial villous atrophy. Both patients had a positive reticulin antibody test, emphasising its usefulness for screening for coeliac disease in "at risk" groups.

We also found a high prevalence of smooth muscle antibody and antinuclear factor in the infertile patients as a whole.[4] None of the women with reduced red cell folate concentrations who had jejunal biopsy had villous atrophy, and presumably the folate deficiency was dietary.

Although we have shown that subclinical coeliac disease is an uncommon cause of infertility, we think that it is important for clinicians to be aware that patients with coeliac disease may present in this way. This is particularly so as it is a readily treatable disorder which, if left untreated, carries the risk of malignancy in later life.

[1] Stevens, F, *et al*, *Gut*, 1975, **16**, 598.
[2] Morris, J S, Adjukiewicz, A B, and Read, A E, *Lancet*, 1970, **1**, 213.
[3] Joske, R A, and Martin, J D, *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 1971, **78**, 754.
[4] Wilson, C, *et al*, *Lancet*, 1975, **2**, 1238.
[5] Harris, O D, *et al*, *American Journal of Medicine*, 1967, **42**, 899.

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New porcine dermis dressing for varicose and traumatic leg ulcers

The most important measure in the management of varicose ulceration is pressure bandaging, usually augmented by local dressings. Chronic ulcers commonly heal slowly, as shown by the many forms of local treatment which have been advocated. Porcine skin dressings have been successfully used to treat burns. One such product consists of lyophilised freeze-dried porcine epidermis and dermis. During experimental work it was discovered that a single 0·3-mm layer of freeze dried dermis alone (Corethium II) possessed interesting properties. Unlike the full-thickness skin, with its waterproof epidermal layer, the permeable dermis can be reconstituted from the freeze-dried state by soaking in normal saline for five minutes, forming a pliable dressing.

To compare healing on conventional and porcine skin therapy we analysed the records of patients referred to the physiotherapy department with varicose and traumatic leg ulcers between 1 October 1974 and 30 September 1975.

Methods and results

Conventional "Bisgaard" treatment consisted of bandaging (Calaband or Quinaband) and elastic support with weekly dressing changes, and in the study group the porcine dermis was applied twice weekly to the eusol-cleaned ulcer and trimmed to its margins. The dressing was completed with an impregnated bandage and elastic support similar to those used in the control group. Healing rate was calculated by tracing the ulcers on sterile film.

Of the 18 patients studied, 10 were treated with Bisgaard therapy and eight with porcine dermis. Twelve ulcers were primarily varicose without history of trauma; the remainder originated from local injury. In one patient in the porcine dermis group healing rates were calculated for three separate ulcers.

Results of treatment

Treatment	Type of ulcer	Number of ulcers	Mean ulcer area at start of treatment (cm^2) (range)	Mean duration of treatment (weeks)	Healing rate (cm^2/week)
"Bisgaard"	Varicose	8	12·9 (0·8–44·6)	14·9	0·9
	Traumatic	2	5·5 (5·3–5·7)	9·5	0·6
Porcine dermis	Varicose	6	17·2 (2·9–37·9)	9·2	1·8
	Traumatic	4	25·7 (6·8–68·3)	9·8	2·5

Two patients who had deteriorated on Bisgaard treatment were transferred to the porcine dermis group. The mean healing rate for varicose ulcers in the porcine dressing group (1·79 cm^2/week) was roughly twice as fast as in the Bisgaard group (0·85 cm^2/week). The same trend was observed for the traumatic ulcers (see table). No ulcer treated with porcine dermis has so far failed to heal. The two patients whose ulcers deteriorated on the Bisgaard regimen secured good healing after transfer to porcine dressings. There were no unfavourable local or systemic reactions.

Discussion

The healing in the "control" group with the Bisgaard treatment was the best that could be achieved by conventional means in a department with a long experience of the problem. A striking feature of the porcine-treated ulcers was the rapidity with which granulation tissue formed. Though the use of lyophilised split skin homograft and porcine heterograft for leg ulcers has been reported,[1–3] we believe that this is the first account of the successful use of a separate dermal layer. Questions of relative convenience, cost, and optimal dressing techniques have still to be worked out. We recognise the limitations of retrospective analysis but are sufficiently encouraged to proceed with a prospective clinical trial for further evaluation of this material.

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[1] Elliot, R A, and Hoehn, J G, *Plastic and Reconstructive Surgery*, 1973 **52**, 401.
[2] State, D, and Peter, M E, *Surgery, Gynecology and Obstetrics*, 1974, **138**, 13.
[3] Hackett, M E J, *British Journal of Hospital Medicine*, 1975, **13**, 272.

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