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SHORT REPORTS

Effect of magnesium supplementation on blood pressure and electrolyte concentrations in hypertensive patients receiving long term diuretic treatment

Dyckner and Wester carried out an uncontrolled study to investigate the effects of magnesium supplementation on electrolyte concentrations in 39 patients receiving long term treatment with diuretics.[1] Though no changes were found in electrolyte concentrations, a significant reduction in systolic and diastolic pressures occurred. We conducted a multicentre, double blind randomised study of supplementation with magnesium in patients treated for hypertension with potassium depleting diuretics for more than six months.

Patients, methods, and results

Patients were recruited from five general practices. Criteria for entry were hypertension treated with potassium depleting diuretics for more than six months; diastolic blood pressure <105 mm Hg; serum creatinine concentration <200 μmol/l (<2·3 mg/100 ml); no evidence of cardiac failure; no chronic diarrhoea; and no regular use of drugs containing magnesium. Patients were seen at time 0; at one week, when treatment was started; and one, three, and six months after the start of treatment. At each visit systolic and diastolic pressures were measured. Serum potassium, sodium, creatinine, and magnesium concentrations were measured at time 0 and at three and six months. The lowest values of systolic and diastolic pressures recorded at one week were taken as the pretreatment blood pressure, and patients fulfilling the entry criteria were randomised blindly to treatment with magnesium oxide 500 mg (301 mg magnesium) or placebo tablets of identical appearance and instructed to take one tablet daily. Statistical analysis was by the two tailed *t* test (paired and unpaired) and the χ^2 test.

Forty one patients were admitted to the study, of whom 20 were randomised to receive placebo and 21 to receive magnesium supplementation. One patient was withdrawn from the magnesium group after one month because of hypokalaemia. There were no differences in age, sex, duration of diuretic treatment, serum electrolyte concentrations, or systolic blood pressure between the two groups at entry. The mean age in both groups was 62, and three quarters of the patients had been taking diuretics for more than two years. Diastolic blood pressure at entry was significantly lower in the group given magnesium (87 mm Hg *v* 93 mm Hg in the placebo group; p=0·02, unpaired *t* test; 95% confidence interval 1 to 10 mm Hg). The table shows electrolyte concentrations and blood pressures before and after treatment.

The diastolic blood pressure in the group given magnesium was extremely stable, being 87 mm Hg before entry to the study, 86 mm Hg after three months'

Mean (SD) blood pressure, serum electrolyte concentrations, and creatinine concentrations before and after three and six months' treatment in patients given placebo (n=20) and those given magnesium supplementation (n=20)

	At entry to trial		After 3 months		After 6 months		
	Placebo group	Magnesium group	Placebo group	Magnesium group	Placebo group	Magnesium group	Significance
Creatinine (μmol/l)	98 (24)	95 (17)	100 (21)	97 (18)	101 (21)	95 (18)	NS
Potassium (mmol/l)	3·7 (0·5)	3·9 (0·4)	3·8 (0·3)	3·8 (0·3)	3·8 (0·4)	3·9 (0·4)	NS
Sodium (mmol/l)	141 (3)	141 (3)	140 (3)	141 (3)	141 (3)	141 (3)	NS
Magnesium (mmol/l)	0·81 (0·07)	0·78 (0·10)	0·79 (0·07)	0·81 (0·10)	0·79 (0·08)	0·81 (0·09)	NS
Blood pressure (mm Hg):							
Systolic	157 (24)	154 (19)	155 (19)	148 (19)	154 (22)	150 (20)	NS
Diastolic	93 (8)	87 (6)	92 (7)	86 (8)	92 (6)	88 (7)	*

*Difference in diastolic blood pressure between groups before treatment: p=0·02 (unpaired *t* test).
Conversion: SI to traditional units—Creatinine: 1 μmol/l≈11·3 μg/100 ml. Potassium: 1 mmol/l=1 mEq/l. Sodium: 1 mmol/l=1 mEq/l. Magnesium: 1 mmol/l≈2·4 mg/100 ml.

treatment, and 88 mm Hg after six months' treatment ($p>0·5$, paired t test; 95% confidence interval for the difference between means −3 to + 4 mm Hg). Similar stability was seen in the placebo group, in whom the corresponding diastolic pressures were 93, 92, and 92 mm Hg ($p>0·30$, paired t test; 95% confidence interval −5 to + 2 mm Hg). After six months' treatment the change in blood pressure from the pretreatment value was not significantly different between the two groups (diastolic: $p=0·4$ (unpaired t test), 95% confidence interval for the difference between means −3 to + 7 mm Hg; systolic: $p=0·9$ (unpaired t test), 95% confidence interval −9 to + 8 mm Hg).

There was no significant difference in serum magnesium, potassium, sodium, or creatinine concentrations between the two groups after six months' treatment ($p>0·05$, unpaired t test).

Comment

In spite of the fact that our trial was designed to detect a minimal relevant difference of 7 mm Hg in diastolic pressure at the 5% significance level with a power of 85% and an estimated standard deviation of 7 mm Hg[2] we were unable to confirm Dyckner and Wester's finding of an apparent hypotensive effect of magnesium supplementation. Our trial indicates that magnesium supplementation does not exert a clinically important effect on blood pressure when given to hypertensive patients receiving long term diuretic treatment.

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A simple grading system to guide the prognosis after hip fracture in the elderly

Kellogg Speed described fracture of the neck of femur as "the unsolved fracture," and much work has been carried out to find the surgical solution to this fracture. The problem is not simply a surgical one, however, and the social implications should not be underestimated. Miller suggested that fracture of the hip may be viewed as a disease with a predictable rate and pattern of mortality.[3] The importance of social circumstances and state of general health at the time of fracture in influencing the rehabilitation of elderly patients with hip fractures has been shown.[1-3] Predictive studies of rehabilitation after hip fracture are scarce, and those which have been published fail to offer an uncomplicated bedside grading system suitable for routine use at the time of admission.[3-5] In a prospective study of 322 patients we have tested a simple bedside formula for use as a guide to prognosis after fracture of the femoral neck.

Patients, methods, and results

A prospective study of 322 patients over the age of 65 with fractures of the femoral neck (intracapsular and extracapsular) was carried out. Patients were assessed by one of the authors before surgery and allocated points according to social circumstances and medical state. For social circumstances those who were totally independent were given one point, those living alone with help two points, and those living in an institution three points. For medical state those in good general health were given one point, those with satisfactory general health but a history of previous serious illness two points, and those with poor health three points. The scores from both categories were added, giving each patient a possible combined score of two to six. Six months after surgery the patients' circumstances were reassessed by one of the authors. They fell into one of three unambiguous categories: satisfactory (back to original circumstances within six weeks of fracture), poor (still in hospital six weeks after fracture with no immediate prospect of return to previous circumstances), and dead.

Six months after fracture 48 (15%) of the patients had died. This compares favourably with other studies.[1] The table compares the numbers of patients with satisfactory results, patients with poor results, and those who died according to total score.

Outcome of treatment according to points scored at initial assessment

	Score at initial assessment				
	2 (n=109)	3 (n=81)	4 (n=88)	5 (n=29)	6 (n=15)
Outcome of treatment (% of patients):					
Satisfactory	93	79	20	0	0
Poor	4	11	69	59	13
Died	3	10	11	41	87

Comment

The most important finding of this study was that no patient with a score of 5 or 6 had a satisfactory result. Those with scores of 3 or less can be expected to make satisfactory progress, while those with scores of 5 or 6 are unlikely to return to their circumstances before the fracture. Thus an elderly person living either on her own or in an institution who is in poor health is unlikely to return to her original circumstances. With vigorous rehabilitation the outcome for those with a score of 4 may be improved. At a time of limited resources the question arises as to whether those with scores of 5 or 6 should be placed in long stay care immediately after surgery, thus freeing the rehabilitation team to concentrate on those with a prospect of satisfactory recovery. This simple scoring system is easy to remember and can give an instant bedside guide to prognosis after hip fracture.

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Severe cutaneous reactions to alternative remedies

"Alternative" or "complementary" treatments are widely employed by patients, often without medical advice. Three cases are described of severe cutaneous reactions to alternative remedies.

Case reports

Case 1—A 46 year old man presented with erosion and blistering of the mouth, lips, and penis and soreness and redness of the eyes. The appearance was that of the Stevens-Johnson syndrome and he was admitted to hospital, where he required systemic steroid treatment. He gave no history of preceding illness or infection and was taking no medications. He did, however, admit that one week before the onset of the eruption he had visited a health food shop looking for a general tonic; he had purchased two bottles of tablets, one unlabelled, subsequent analysis of which yielded only lactose, and the other called "Golden Health Blood Purifying Tablets": these contained extracts of red clover, burdock, queen's delight, poke root, prickly ash, sassafras bark, and *Passiflora*. He admitted that some months previously he had had a similar, but rather less severe reaction a few days after taking these tablets. The patient's condition resolved, but 10 months later he returned with a clinically identical eruption, again after the use of Golden Health Blood Purifying Tablets.

Case 2—A 56 year old man presented with an acute generalised pusular psoriasis. He gave a 25 year history of chronic plaque psoriasis, which had been