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SHORT REPORTS

Role of glucocorticoids in management of malignant hypercalcaemia

Glucocorticoids are commonly prescribed in malignant hypercalcaemia due to carcinoma¹ despite conflicting evidence on their efficacy.² We examined the effects of prednisolone on hypercalcaemia in patients with solid tumours.

Patients, methods, and results

We studied 28 patients with hypercalcaemia associated with solid tumours (breast, 17 patients; bronchus, six; cervix, four; hypernephroma, one). All but four patients had scintigraphic or radiographic evidence of metastases of bone. All patients were treated continuously with intravenous saline (4-6

portant component of management.⁵ As the efficacy of rehydration is commonly underestimated additional agents are often prescribed. Any hypocalcaemic response then observed may be due to the additional treatment rather than to rehydration. Our study suggests that the use of glucocorticoids to treat hypercalcaemia due to solid tumours is ineffective and that the responses observed were entirely attributable to rehydration. As steroids are not free of risk and have catabolic effects on bone we now avoid giving them to patients with malignant hypercalcaemia. Corticosteroids remain useful, however, in the treatment of hypercalcaemia due to other causes, particularly myeloma, sarcoidosis, and vitamin D toxicity.²

Mean (SEM) serum calcium and creatinine concentrations in patients with hyperglycaemia treated with rehydration alone or combined with corticosteroids

	Saline alone			Saline + steroids		
	Day 0	Day 3	Day 7	Day 0	Day 3	Day 7
Adjusted serum calcium (mmol/l)	3.49 (0.13)	3.21 (0.13)**	2.86 (0.16)*	3.56 (0.17)	3.24 (0.12)**	3.02 (0.08)**
Serum creatinine (μ mol/l)	0.119 (9.8)	108 (13.3)**	80 (10)*	148 (22)	131 (27)*	103 (13)**

Significance of changes induced by treatment: * $p < 0.02$; ** $p < 0.01$.

Conversion: SI to traditional units—Calcium: 1 mmol/l = 4 mg/100 ml. Creatinine: 1 μ mol/l $\approx$ 11.3 μ g/100 ml.

litres daily), and 15 were additionally treated with prednisolone (20-60 mg daily by mouth). None of the patients received diuretics, chemotherapy, or other agents likely to affect the serum calcium concentration. Venous blood samples obtained before treatment and at three and seven days were analysed for serum calcium, creatinine, and albumin concentrations with a Technicon SMAC AutoAnalyzer. Calcium values were adjusted to an albumin concentration of 42 g/l. The significance of changes between mean values was assessed with a two tailed Wilcoxon's rank sum test for paired observations. Results are expressed as means (SEM).

Patients given saline alone and those given saline and prednisolone were similar with regard to age (64 (3) v 51 (3) years); initial serum calcium concentration (3.49 (0.13) v 3.56 (0.17) mmol/l (14 (0.5) v 14 (0.7) mg/100 ml)); serum albumin concentration (35 (1) v 35 (1) g/l); and serum creatinine concentration (119 (10) v 131 (27) μ mol/l (1.3 (1.1) v 1.5 (0.3) mg/100 ml)). Treatment with saline alone induced a significant fall in serum calcium concentrations (mean decrease 0.40 (0.12) mmol/l (1.6 (0.5) mg/100 ml) at seven days), which was associated with a significant fall in serum albumin and creatinine concentrations (table). The addition of prednisolone to the intravenous fluid regimen did not confer any additional benefit.

Comment

Dehydration helps to perpetuate or aggravate hypercalcaemia of whatever origin,^{3 4} and, therefore, attention to fluid balance is an im-

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