Hypomagnesemic Hypocalcemia: A Brief Report

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Dear Sir,

Hypocalcemic hypomagnasemia may be due to either defective release of parathyroid hormone (PTH) or resistance to the peripheral effects of PTH [1-6]. We would like to report a patient with hypomagnesemia associated with hypocalcemia due to PTH resistance and the bone biopsy findings in this condition, which have not hitherto been described.

A 65-year-old female presented with profound hypomagnesemia (0.47 mmol/l) and hypocalcemia (total calcium < 1 mmol/l). Serum Na⁺, K⁺, phosphate and creatinine were 144 mmol/l, 4.4 mmol/l, 1.98 mmol/l and 246 µmol/l, respectively. Serum iPTH was 161 pg/l (normal range 10-55) and alkaline phosphatase 90 µ/l (normal range 30-110).

The patient was resuscitated with Ca²⁺ and Mg²⁺ supplements and α-calciol. Ca²⁺ and Mg²⁺ levels increased to 2.63 and 1.02 mmol/l, respectively, over the following week. PTH level fell to 12.6 pg/l. All replacement therapy was stopped. Serum creatinine remained stable, but Ca²⁺ and Mg²⁺ declined to 1.65 and 0.65 mmol/l, respectively, and PTH increased to 119 pg/l. At that time, urinary Mg²⁺ concentration was 1.7 mmol/l with a calculated fractional excretion of Mg²⁺ of 10.1%, in keeping with urinary Mg²⁺ wasting [7, 8]. Nephrogenous cyclic AMP was 220 nmol/mmol creatinine (normal 8-270) and tubular reabsorption of phosphate 85.5%. Radiographs of the hands, pelvis, clavicles, chest and skull showed mild osteopenia, and transiliac bone biopsy revealed mild osteo-malacia with no evidence of secondary hyper-parathyroidism. Overall, these results are highly suggestive of skeletal and renal resistance to PTH. Additionally, this is the first report (as far as we are aware) of bone biopsy data in this condition.

Oral Mg²⁺ was recommenced without Ca²⁺ supplementation. Over the next 2 weeks, both serum Mg²⁺ and Ca²⁺ normalized (0.89 and 2.13 mmol/l, respectively). The patient remained well over a follow-up period of 12 months. Changes in serum magnesium and calcium in relation to treatment are shown in figure 1.

x Calcium © Magnesium

/// Magnesium chloride

67%k Calcium carbonate

wm α-Calciol

M Calcium gluconate (intravenous)

3.0

7 14

Time, days

Fig. 1. Serum calcium and magnesium concentrations plotted against time with replacement therapy indicated above the x axis.

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0654-0655\$2.75/0