Clinical Reports

A case of resolving idiopathic hypoparathyroidism

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Summary: A 72 year old man developed idiopathic hypoparathyroidism. The condition spontaneously resolved which, to our knowledge, has not been previously described. Causes of fluctuating hypocalcaemia are outlined and their possible relevance to our patient discussed.

Introduction

Idiopathic hypoparathyroidism is a rare condition (incidence approximately 0.02%)¹ which may occur as an isolated disorder or as an autoimmune condition in association with diminished or absent function of other endocrine glands. The onset of isolated idiopathic hypoparathyroidism may be at any age up to the eighth decade² and it is present life-long. Recovery of parathyroid function has not been previously described, autopsy of these patients showing the parathyroids to be absent, rudimentary, atrophic or replaced by fat.^{3,4} A case of idiopathic hypoparathyroidism is presented in a 72 year old man, which over 2 years appears to have spontaneously resolved.

Case report

A 72 year old retired green keeper of Irish origin presented in 1985 with a 2-month history of general malaise and tiredness and a 2-week history of intermittent paraesthesia in his left hand. Three weeks previously he had had an episode of colicky abdominal pain and vomiting which had resolved.

He had a dislocation of C4/5 vertebrae following a fall 2 years previously, treated by anterior fusion. He was not on medication, took no vitamin supplements and had no family history of endocrine disorders. His daily vitamin D and calcium intakes were 2.2 µg and 490 mg, respectively.

On examination he was obese with positive Trousseau and Chvostek's signs. There was no moniliasis, cataracts or papilloedema. The metacarpals were normal. He had a blood pressure of 170/110 mmHg.

The initial investigations are detailed in Table I. The plasma cyclic AMP response to intravenous parathyroid hormone (PTH) infusion was studied using the protocol of Tomlinson *et al.*^{7,8} The result was within normal limits (Figure 1).

Full blood count, erythrocyte sedimentation rate, urea and electrolytes, liver function tests, gamma-glutamyl transpeptidase and immunoglobulins were all normal. Parietal cell, mitochondrial, smooth muscle, reticulin, thyroid microsomal, thyroglobulin and antinuclear antibodies were all absent.

An electrocardiograph showed sinus rhythm with an old anterior infarct and no prolonged QTc. A chest radiograph was normal and radiograph of his hands showed degenerative changes only; a skull radiograph showed some calcification in the choroid plexus.

Table I Initial biochemical results

<i>Plasma</i>	
corrected calcium	1.53–1.66 mmol/l (2.16–2.58)*
phosphate	1.63 mmol/l (0.75–1.36)
25 OH vitamin D	142 mmol/l (10–120)
PTH	<40 pg/ml (<120) ⁵
N terminus	not detectable (<0.6 ng ml) ⁶
C terminus	
Free triiodothyronine	6.3 pmol/l (3.0–9.5)
TSH	1.1 mIU/l (0.3–6.5)
magnesium	0.76 mmol/l (0.61–1.00)
bicarbonate	28 mmol/l (20–30)
<i>Urine</i>	
calcium	1.8 mmol/24 h (2.5–8.7)
creatinine clearance	74 ml/min

*Normal range for laboratory in brackets after results.

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Figure 1 Response of blood cyclic AMP to intravenous parathyroid hormone.

Treatment and progress

He was started on calcitriol 0.25 µg and calcium gluconate 1.2 g/day. His response to treatment and alterations in medication are shown in Figure 2. There was an initial slow response requiring an increase in the dose of calcitriol to 0.5 µg/day. After 18 months' treatment he became hypercalcaemic requiring a reduction in calcitriol which was followed by hypocalcaemia requiring an increase. Again he became hypercalcaemic on calcitriol 0.5 µg/day and so his treatment was reduced and then stopped in December 1988. He has remained normocalcaemic over the past 16 months.

Repeat PTH level in March 1989 was 1.6 pmol/l (normal range 1.0–5.3)⁹ ('Nicholls' 2-site immunoradiometric assay), with 25 hydroxyvitamin D 123 nmol/l (NR 10–120) and corrected calcium of 2.27 mmol/l. In December 1989 his PTH was low at 0.5 mmol/l, 25 hydroxyvitamin D 147, with a corrected calcium of 2.20 mmol/l. Plasma 25 hydroxy and 1,25 dihydroxyvitamin D levels were measured in the same specimen by Dr E.B. Mawer.^{10–12} The 25 hydroxyvitamin D level was frankly high at 114 (NR 12.5–75) nmol/l and the 1,25 dihydroxyvitamin D level was low at 19 pmol/l (29–120). In March 1990 his PTH was 2.4, 25 hydroxyvitamin D (in house method) 115 nmol/l, and corrected calcium 2.45 mmol/l.

Discussion

This patient presented initially as a case of idiopathic hypoparathyroidism. However, the subsequent course of his condition with intermittent hyper- and normocalcaemia on a small dose of calcitriol and finally complete resolution, has not been previously described. In addition, with a normal creatinine clearance, he has had an unexplained persistently high normal or frankly raised

Figure 2 Serum calcium levels from July 1985 to April 1990 during treatment with calcitriol and calcium. ▨ Calcitriol 0.25 µg; ▨ calcium 2 mmol.

plasma 25 hydroxyvitamin D with a low plasma 1,25 dihydroxyvitamin D concentration while off all medication. Atypical pancreatitis was considered, but the hypocalcaemia in this condition, not associated directly with hypoalbuminaemia, results in markedly raised parathyroid hormone levels.¹³

Drake *et al.* (1939)¹⁴ proposed the following criteria for diagnosis of hypoparathyroidism: hypocalcaemia and hyperphosphataemia, with normal renal function; signs and symptoms of tetany, in the absence of alkalosis; and negative radiological findings (to exclude osteomalacia and rickets). The low or normal PTH levels and brisk response of cAMP excretion to i.v. PTH established in our patient that he did not suffer from pseudohypoparathyroidism,^{7,8} a condition in which fluctuations of the plasma calcium in and out of the normal range can occur. Unlike the patient we describe, these patients have an elevated plasma PTH level and in the type I syndrome do not show the normal increase in cAMP production after i.v. PTH.

To our knowledge, spontaneous resolution of adult onset idiopathic hypoparathyroidism has not been previously described. However, patients with pseudohypoparathyroidism,¹⁵ congenital hypoparathyroidism^{16,17} and hypoparathyroidism secondary to thyroid surgery^{18,19} may have fluctuating calcium levels, hypocalcaemia occurring only at times of greater calcium demands.

In congenital hypoparathyroidism, complete recovery may sometimes occur within a few months.^{20,21} However, some workers have speculated that this recovery may represent a compensated form of hypoparathyroidism, rather than true resolution. Bainbridge and colleagues²² described a case of an infant who, despite being normocalcaemic off all treatment at 22 months, did

not show a rise in PTH in response to hypocalcaemia induced by EDTA infusion. They concluded that the parathyroid glands can produce just enough PTH to allow normal calcium homeostasis under basal conditions only. Since our patient did not present until 72 years, it is unlikely that his hypoparathyroidism is congenital.

Finally, in 1936 Kramer¹⁸ postulated a condition of partial parathyroid insufficiency and this was confirmed by Smith *et al.* (1960).¹⁹ Smith studied 14 patients post-thyroidectomy, 9 of whom had low normal calcium levels not requiring treatment. However, with calcium deprivation (induced by sodium phytate and a low calcium diet), 7 of the 9 became hypocalcaemic, a response not seen in normals. Our patient had had an anterior fusion of his cervical spine 2 years before presentation using the technique described by Robinson and Riley.^{23,24} However, this operation, which was uneventful, involved unilateral fixation at C4-5. It is rare (<1%) to have less than 4 parathyroid glands and their anatomical location shows considerable con-

stancy,²⁵ usually with symmetrical distribution,²⁶ making damage to all glands unlikely.

Hypoparathyroidism is typically associated with a normal 25 hydroxyvitamin D with a low 1,25²⁷ due to reduced activity of 1 α hydroxylase secondary to PTH deficiency.²⁸ Increase in plasma 25 hydroxyvitamin D levels following sun exposure is well established,^{29,30} but not relevant to our patient.

In conclusion, we describe the first case of idiopathic hypoparathyroidism which to our knowledge has spontaneously resolved, the patient being asymptomatic off all treatment. Causes of fluctuating hypocalcaemia have been discussed and do not appear to be applicable to our patient.

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