Case Report: Hypercalcemia in an Older Patient with Type I Lepra Reaction

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Abstract. Leprosy is a rare, chronic granulomatous disease, and India accounts for two-thirds of the new cases reported worldwide. Hypercalcemia is a rare complication of granulomatous disease. Here, we report a case of an older adult patient with leprosy and type I lepra reaction presenting with severe hypercalcemia.

INTRODUCTION

Hypercalcemia is not uncommon among older patients. Hyperparathyroidism and malignancy are the most common causes of hypercalcemia in this population. Granulomatous diseases such as tuberculosis, sarcoidosis, fungal infections, and berylliosis are few uncommon causes. The proposed mechanism includes dysregulated production of 1,25-hydroxyvitamin D₃ by the activated macrophages.¹ We report an older patient with borderline tuberculoid leprosy, with type I lepra reaction, presenting with acute hypercalcemia with normal 1,25-hydroxyvitamin D₃ and parathyroid hormone-related peptide.

CASE REPORT

This 78-year-old male patient, with a past history significant for coronary artery disease, and diagnosed to have Hansen's disease 5 months back, on multidrug therapy, was diagnosed to have type I lepra reaction 1 month ago. He presented to us with a history of increased frequency of micturition for 1 week associated with urge incontinence, with no history of fever, burning micturition, flank pain, or hematuria.

On examination, he was found to have pallor, bilateral pedal edema, and multiple erythematous macular rashes over the arm, forearm, trunk, and lower limb, and there was no evidence of neurologic deficit. Systemic examination was normal. Laboratory investigations revealed anemia, with hemoglobin of 8.6 g/dL (12–15 g/dL), corrected calcium of 14.42 mg/dL (8.50–10.50 mg/dL), urea of 69 mg/dL (10–40 mg/dL), and serum creatinine of 2.49 mg/dL (0.5–11.0 mg/dL). The peripheral smear revealed normocytic normochromic to microcytic hypochromic red blood cells, with a corrected reticulocyte count of 2.0. Serum iron studies were suggestive of anemia of inflammation, and serum folate and active B12 were also within the normal range. Intact parathyroid hormone was 8.3 pg/mL (15–68.3 pg/mL), 25-hydroxyvitamin D was 26.7 ng/mL (25–80 ng/mL), 1,25-dihydroxyvitamin D was 18.4 pg/mL (15–75 pg/mL), and parathyroid hormone-related peptide was 14 pg/mL (14–27 pg/mL). The patient was started on intravenous normal saline along with diuretics (furosemide) for the management of hypercalcemia. Given that the patient had a deranged renal function, bisphosphonates were not prescribed. Injection calcitonin salmon 280 IU (4 IU/kg) was given subcutaneously every 12 hourly for 48 hours. On the fifth day, his serum calcium level was 10.1 mg/dL and serum creatinine reduced to 1.4 mg/dL, and he did not require treatment with steroid. His skeletal survey was normal,

and serum and urine for M-band were negative. Positron emission tomography was performed, which showed no features of malignancy. He was diagnosed to have hypercalcemia due to borderline tuberculoid leprosy, with type I lepra reaction with anemia of inflammation.

DISCUSSION

Hypercalcemia in older individuals has varied manifestations, ranging from being asymptomatic to the development of delirium. And the common causes include hyperthyroidism, and malignancies such as carcinoma lung, multiple myeloma, and lymphoma. Granulomatous diseases are a rarer cause of hypercalcemia, and these include tuberculosis, sarcoidosis, fungal infections, Crohn's disease, silicon-induced granulomas, and leprosy. Among these, leprosy produces a spectral diversity in tissue responses. The proposed mechanism for the development of hypercalcemia in granulomatous diseases such as sarcoidosis and tuberculosis includes overproduction of 1,25-dihydroxyvitamin D by the activated macrophages. But the exact mechanism of hypercalcemia in patients with leprosy is not established.

In previously reported cases, hypercalcemia was present in patients with both lepromatous and tuberculoid leprosy.^{2–4} We report for the first time a case of leprosy with type I lepra reaction presenting with severe hypercalcemia. Type I reaction mainly occurs in the nonpolar forms of leprosy,⁵ as in the case of our patient, and it is associated with the activation of cellular immunity. The reversal reaction is mediated through Th1 lymphocytes, and these cells express pro-inflammatory cytokines, including interferon-gamma, interleukin 12, and oxygen-free radicals.⁶ One may speculate that different morphological appearances of macrophages in lesions of leprosy may reflect different functionalities; that is, epithelioid and foamy macrophages in tuberculoid and lepromatous leprosy, respectively, may be related to mechanisms of hypercalcemia.⁷

These reactions occur mainly during the first 6 months of initiation of multidrug therapy. In the presence of nerve involvement, it should be treated with corticosteroids (oral prednisolone 40–60 mg daily). It has multiple effects on cytokine production, through inhibition of nuclear factor kappa B-induced transcription of cytokine mRNAs.⁸ But as our patient had no nerve involvement, his lepra reaction was managed with acetaminophen. On follow-up after 1 month, the patient's skin lesions have decreased, and the calcium level continues to be normal.

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