SCIENCE SET
OPEN ACCESS PUBLISHERS

Case Report

Journal of Infectious Diseases and Viruses Research

A Rare Case of Intestinal Tuberculosis Associated Hypercalcaemia

Tilan Aponso[a*], Wanninayaka WMDAS[b], and Nawarathna NMM[a]

[a]*Gastrointestinal and Hepatology Unit, National Hospital Colombo, Sri Lanka*
[b]*Medical Unit, National Hospital Colombo, Sri Lanka*

[*]**Corresponding author:** Tilan Aponso, Gastrointestinal and Hepatology Unit, National Hospital Colombo, Sri Lanka.

Submitted: 11 March 2024 **Accepted:** 18 March 2024 **Published:** 25 March 2024

Citation: *Tilan Aponso, Wanninayakab WMDAS, and Nawarathna NMM (2024) A Rare Case of Intestinal Tuberculosis Associated Hypercalcaemia. J Infec Dise and Vir Res 3(2), 01-03.*

Abstract

Tuberculosis is a disease that can affect many organs in the human body and is caused by Mycobacterium tuberculosis. Abdominal tuberculosis is uncommon, with a reported incidence of 2.5% among extrapulmonary tuberculosis patients in the United States. Hypercalcemia in tuberculosis is a rare complication with a prevalence that varies between 2.3 and 28%. Most hypercalcemic patients with tuberculosis remain asymptomatic. (88%) We report a patient with non-PTH-related hypercalcemia as the presenting complaint who was later diagnosed with intestinal tuberculosis.

Introduction

Tuberculosis is a disease that can affect every organ in the human body and is caused by Mycobacterium tuberculosis. Roughly 10 million people were infected with Mycobacterium tuberculosis in 2017, and 1.3 million patients died due to tuberculosis. Among tuberculosis patients, around 14% had extrapulmonary tuberculosis in 2017, and around 2.5% were reported to have intestinal tuberculosis. Among patients with extrapulmonary tuberculosis, 15-20% had concomitant pulmonary tuberculosis [1-3].

Abdominal tuberculosis can affect the entire gastrointestinal tract, including the mouth to the anus (49%), peritoneum (42%), mesenteric lymph nodes (4%) and the solid organs, including the liver and pancreas (5%) [4]. The presentation of abdominal tuberculosis is nonspecific, and 85% of the patients had abdominal pain. Loss of weight (66%), fever (35–50%), diarrhea (20%), malabsorption (21–75%), and mass in the right lower quadrant (25–50%) are some other frequent presentations. Hypercalcemia in tuberculosis is a rare complication with a prevalence that varies between 2.3 and 28%. Most of the hypercalcemic patients with tuberculosis remain asymptomatic (88%) [5-7].

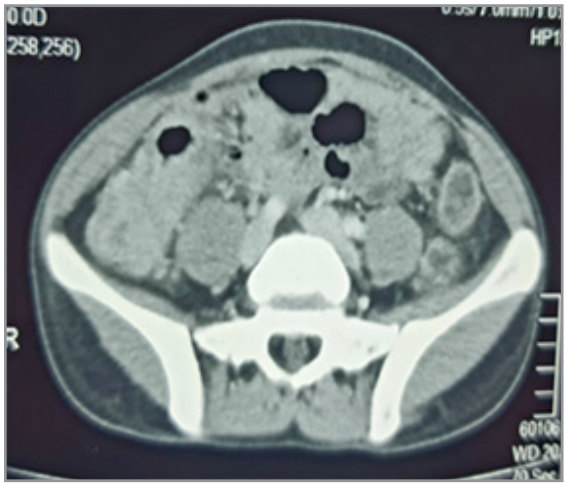
Case Report

A 29-year-old male patient presented with nonspecific right lower abdominal pain and loss of weight for 3 months. On examination, he was cachectic. Respiratory and other system examinations were unremarkable.

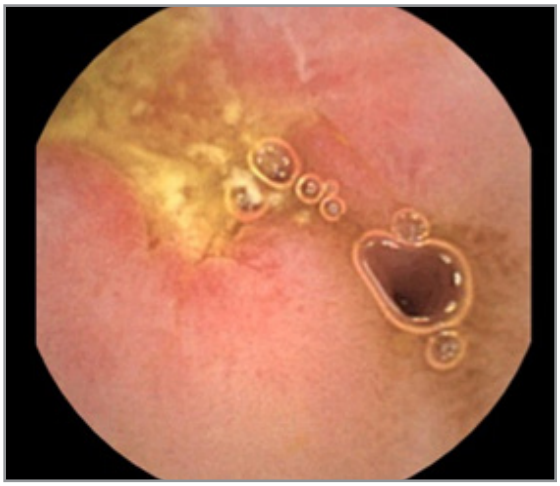
He had an iron deficiency anemia (Hb 8.5 g/L) with normal liver biochemistry and renal function tests and elevated inflammatory markers (ESR 65 mm/1 hr). His corrected serum calcium level was 3.1 mmol/L (normal value: 2.2 to 2.7 mmol/L) with a phosphate of 1.37 mmol/L (normal value: 1.12 to 1.45 mmol/L). 25 (OH) vitamin D level was 8 ng/mL (normal values of 20 and 40 ng/mL). His intact parathyroid hormone level was 6 pg/mL(normal value: 10–65 pg/mL).

Chest radiography was normal, with a negative sputum AFB. He underwent CECT abdomen and was found to have circumferentially enhanced wall thickening involving the terminal ileum and the caecum, causing luminal narrowing (Figure 1). He had a positive stool calprotectin on qualitative analysis.

On colonoscopic examination, a distorted ileocaecal valve with patchy inflammation and transverse ulcers were present in the terminal ileum. (Figure 1). On histology, there were granulomas composed of epithelioid histiocytes with necrosis, submucosal inflammation, cryptitis, and crypt abscesses. His Mantoux test and TB PCR on the biopsy sample were positive.



CECT abdomen
There is circumferentially enhanced wall thickening involving the terminal ileum and the caecum, causing luminal narrowing. Mild perienteric strandings are seen. The adjacent mesentery is congested.



Colonoscopy
Deep ulcer in the terminal ileum

Figure 1: CECT abdomen and colonoscopy images

He started antituberculosis treatment and had a good clinical response, a normal repeat CECT abdomen, corrected calcium, and complete mucosal healing on repeat endoscopy 6 months after antituberculosis treatment.

Discussion

Hypercalcemia has a prevalence rate of 1% of the worldwide population [8]. Hypercalcemia can be parathyroid hormone-dependent or independent. Non-PTH-related hypercalcemia occurs in malignancies, granulomatous diseases, endocrinopathies, and vitamin D intoxication. Squamous cell carcinoma of the head, neck, and lungs, breast carcinoma, ovarian carcinoma, renal carcinoma, and hematological malignancies like leukemia and lymphomas are some of the malignant causes of hypercalcemia.

If the calcium level is less than 12 mg/dL (3 mmol/L), it is called mild hypercalcemia. Between 12 and 14 mg/dL (3–3.5 mmol/L), it is called moderate, and more than 14 mg/dL (3.5 mmol/L), it is called severe hypercalcemia. In a patient with severe hypercalcemia, malignancies are an important differential diagnosis to exclude, and hypercalcemia in a malignant patient is a poor prognostic marker. Our patient had moderate, non-PTH-related hypercalcemia [9, 10].

Hodgkin lymphoma, non-Hodgkin lymphoma, and granulomatous diseases like sarcoidosis and tuberculosis can cause hypercalcemia by increasing 1,25-dihydroxyvitamin D production. Patients with tuberculosis generally develop asymptomatic, mild hypercalcemia. Hypercalcemia is associated with all forms of tuberculosis, and severe hypercalcemia can be present in disseminated tuberculosis [11].

Our patient had non-PTH-related hypercalcemia and intestinal tuberculosis. The presenting symptom was nonspecific, dull abdominal pain. 85% of intestinal tuberculosis patients had abdominal pain, but in this patient, hypercalcemia-related abdominal pain, acute pancreatitis, and obstructive uropathy were some other causes of abdominal pain that we have excluded [5].

The mechanisms underlying the development of hypercalcemia are multifactorial. In the past, hypercalcemia in tuberculosis was associated with cod liver oil supplementation for lupus vulgaris [9]. But now several mechanisms have been identified for the development of hypercalcemia in tuberculosis.

Alterations in the metabolism of vitamin D, isoniazide, or tuberculosis-induced increased osteoclast activity can cause hypercalcemia in tuberculosis. In tuberculosis, macrophages involved in the development of granulomas cause extra renal hydroxylation of 25-hydroxycholcalciferol to 1,25-dihydroxycholecalciferol. 1,25-dihydroxycholecalciferol improves the capacity of the macrophages to kill mycobacteria.

If this process occurs on a large scale, 1,25-dihydroxycholecalciferol can enter the circulation, resulting in hypercalcemia [10, 12]. In a resource-poor setting, we were unable to measure 1,25-dihydroxycholecalciferol levels in our patient.

In hypercalcemic patients with increased 1,25-dihydroxyvitamin D levels, lymphomas, tuberculosis, and sarcoidosis, glucocorticoids should be considered. Steroids decrease vitamin D production and calcium absorption from the intestines. Hypercalcemia is one indication to start steroids in a tuberculosis patient. Our patient was treated with a short course of oral steroids and antituberculosis drugs and had a good response to treatment.

Conclusion

Tuberculosis is a mysterious bacterium that can affect any organ in the body. Hypercalcemia is a rare complication of tuberculosis, and as clinicians working in areas with a high prevalence of tuberculosis, it is important to exclude tuberculosis when suspecting a cause for non-PTH-related hypercalcemia.

Acknowledgements
Not applicable

Funding
None

Contribution
Dr Tilan Aponso and Dr.W.M.D.A.S. Wanninayaka did the literature review and writing of the initial manuscript was done by Dr Tilan Aponso. Dr N.M.M.Nawarathna finalized the manuscript and gave expert opinion. All the authors read and approved the final manuscript.

Ethical Declaration
Not applicable

Consent for Publication
Informed written consent for publication of details was taken from the patient. Consent form can be made available to the editor on request.

Competing Interests
Authors declare that they have no competing interests.

Availability of Data and Materials
The data is available from the corresponding author on reasonable request.

References
1. World Health Organization (2020) Tuberculosis: key fact. Geneva: World Health Organization.
2. Raviglione MC (2018) Tuberculosis In: Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J, editors. Harrison's Principles of Internal Medicine. 20th ed. New York: McGraw-Hill Education 1236-1258.
3. Marshall JB (1993) Tuberculosis of the gastrointestinal tract and peritoneum. Am J Gastroenterol 88: 989-999.
4. Abbas Z (2015) Abdominal tuberculosis. In: Hasan M, Akbar MF, Al-Mahtab M, editors. Textbook of Hepato-Gastroenterology. New Delhi: Jaypee Brothers Medical Pub 68-76.
5. Pattanayak S, Behuria S (2015) Is abdominal tuberculosis a surgical problem? Ann R Coll Surg Engl 97: 414-419.
6. Abbasi AA, Chemplavil JK, Farah S, Muller BF, Arnstein AR (1979) Hypercalcemia in active pulmonary tuberculosis. Ann Intern Med 90: 324-328.
7. Arrais Morais M, Cardoso Teixeira LL, de Sousa Brandão Torres D, da Rocha Klautau Neto PB, Machado Kahwage A (2018) Localized hepatic tuberculosis presenting as severe hypercalcemia. Indian J Tuberc 65: 172 174.
8. Walker MD, Shane E (2022) Hypercalcemia: A Review. JAMA 328: 1624-1636.
9. Sharma OP (2000) Hypercalcemia in granulomatous disorders: A clinical review. Curr Opin Pulm Med 6: 442-447.
10. Abbasi AA, Chemplavil JK, Farah S, Muller BF, Arnstein AR (1979) Hypercalcemia in active pulmonary tuberculosis. Ann Intern Med 90: 324-328.
11. 1Abdullah AS, Adel AM, Hussein RM, Abdullah MA, Yousaf A, et al. (2018) Hypercalcemia and acute pancreatitis in a male patient with acute promyelocytic leukemia and pulmonary tuberculosis. Acta Biomed 89: 23 27.
12. Cadranel J, Garabedian M, Milleron B, Guillozo H, Akoun G, et al. (1990) 1,25(OH) 2D2 production by T lymphocytes and alveolar macrophages recovered by lavage from normocalcemic patients with tuberculosis. J Clin Invest 85: 1588-1593.

Copyright: *©2024 Tilan Aponso, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.*