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Refractory Hypocalcemia: A Case Report

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Abstract **Case Report**

***Introduction*:** Refractory hypocalcemia is a challenging condition that does not respond to standard treatment. One rare cause is malabsorption syndrome, which impairs the absorption of calcium and other nutrients. ***Patient and Methods*:** A 34-year-old female with secondary hypocalcemia and hypothyroidism presented with refractory hypocalcemia. Despite treatment, her calcium levels remained low. Investigations revealed malabsorption, including chronic gastritis with Helicobacter pylori infection and inflammatory bowel lesions. ***Discussion*:** Malabsorption syndromes impair calcium and magnesium absorption, leading to persistent hypocalcemia. Management includes treating the underlying condition and supplementing calcium, vitamin D, and magnesium. ***Conclusion*:** Refractory hypocalcemia due to malabsorption requires early recognition and a multidisciplinary approach, including addressing gastrointestinal issues and providing proper supplementation for effective management.

Keywords: Refractory Hypocalcemia, Malabsorption Syndrome, Secondary Hypoparathyroidism, Magnesium Deficiency.

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INTRODUCTION

Hypocalcemia is a common electrolyte disturbance and medical condition characterized by low blood calcium levels, and that necessitates thorough assessment and management by healthcare providers. Patients with hypocalcemia can exhibit a wide range of symptoms and signs, as low serum calcium levels can affect almost any organ or system in the body. However, in certain cases, hypocalcemia becomes refractory, meaning it does not respond to standard treatments. Refractory hypocalcemia presents a diagnostic and therapeutic challenge for clinicians, as it may be a symptom of an underlying complex and often rare pathology. One of the rarer causes of refractory hypocalcemia is malabsorption syndrome, which leads to impaired absorption of calcium and other essential nutrients.

PATIENTS ET METHODS

This clinical case discusses a patient with refractory hypocalcemia, who was admitted in the Endocrinology, Diabetology and Metabolic diseases department of the Mohamed VI university hospital center in Marrakech, highlighting the underlying mechanisms, treatment options, and the challenges encountered during management.

CLINICAL CASE

A 34-year-old patient was admitted for management of refractory hypocalcemia. She had a history of thyroidectomy 20 years ago, and had been followed secondary hypocalcemia and hypothyroidism by an endocrinologist, she was treated with 125µg of Levothyroxine, 1µg of Alfacalcidol and 2000mg of calcium. She reported symptoms of hypocalcemia such as perioral paresthesias, muscle cramps, and diarrhea as a sign of malabsorption. Clinical examination revealed positive Chvostek sign. Laboratory results showed hypocalcemia with a total calcium level of 59.8 mg/L (normal range: 86-103mg/L) Parathyroid hormone (PTH) was markedly low <4 pg/mL (normal range: 10–65 pg/mL), suggestive of secondary hypoparathyroidism.

The patient was treated with intravenous calcium gluconate and oral calcium and vitamin D supplementation. After aggressive treatment, the calcium levels remained normal. Further investigation into her nutritional status revealed normal vitamin D (25-hydroxyvitamin D level of 50 ng/mL, normal range: 30–100 ng/mL), which likely contributed to the impaired calcium absorption. Additionally, stool analysis demonstrated a low magnesium level of 0.63 mmol/L (normal range: 0.66-1.07 mmol/L), and ferritin level of

20 mg/L, supporting a diagnosis of malabsorption, we increased the dose of Alfacalcidol to its maximum dosage (3 µg/day) and supplemented the patient with magnesium. Paraclinical investigations, such as oesogastroduodenal fibroscopy and colonoscopy, were carried out and revealed moderate chronic gastritis caused by helicobacter pylori, and inflammatory ileal and colonic lesions with no signs of malignancy. Given the persistence of hypocalcemia despite treatment, a diagnosis of refractory hypocalcemia secondary to malabsorption syndrome was established.

The patient was referred to the gastroenterology department for specialist management.

DISCUSSION

Hypocalcemia is often associated with conditions that disrupt the balance of calcium metabolism, such as vitamin D deficiency, renal failure, and parathyroid disorders. However, malabsorption syndromes, including celiac disease, Crohn's disease, and other gastrointestinal disorders, can also result in hypocalcemia by impairing the intestinal absorption of calcium and vitamin D [1]. In this case, the patient's chronic gastritis caused by helicobacter pylori, and inflammatory ileal and colonic lesions, led to significant thereby impairing the absorption of calcium and magnesium.

Calcium absorption in the gastrointestinal tract primarily occurs in the duodenum and jejunum, and its efficiency is highly dependent on the presence of vitamin D, which facilitates the intestinal uptake of calcium [2]. In patients with malabsorption syndromes, the impaired absorption of vitamin D results in secondary hyperparathyroidism, as the parathyroid glands attempt to compensate for the low calcium levels by increasing PTH secretion.

In healthy adults, magnesium balance depends above all on adjusting renal magnesium excretion to net digestive magnesium absorption. Magnesium is absorbed from the small intestine via a calcium- and magnesium-dependent ATPase pump [3, 4]. There are two main causes of hypomagnesaemia: digestive and renal. Digestive causes are essentially malnutrition and malabsorption, chronic diarrhoea, steatorrhoea and surgical sequelae [5].

Refractory hypocalcemia in this context is a result of poor calcium and magnesium absorption. This leads to a vicious cycle of impaired calcium homeostasis, further exacerbated by secondary hypoparathyroidism. In cases of malabsorption, addressing the underlying gastrointestinal condition is crucial to improving nutrient absorption and correcting calcium levels.

Management of refractory hypocalcemia secondary to malabsorption syndromes involves both the treatment of the underlying condition and supplementation of calcium and magnesium. For patients with gastrointestinal disease, the causal treatement is essential to improve nutrient absorption [6].

In our case, the patient was placed on high dose calcium and alfacalcidol, and magnesium supplementation. In our case, a combination of the gastroenterologist spécialist management, appropriate supplementation, and close monitoring of calcium and vitamin D levels led to resolution of the patient's hypocalcemia.

CONCLUSION

Refractory hypocalcemia secondary to malabsorption syndromes, poses a unique challenge in clinical practice. Early recognition and treatment of both the nutritional deficiencies and the underlying gastrointestinal disorder are key to successful management. A multidisciplinary approach, including the involvement of a nutritionist and gastroenterologist, is often necessary for optimal management of such complex cases.

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