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Journal of Parathyroid Disease

Journal of Parathyroid Disease 2024,12, e11261

DOI:10.34172/jpd.2024.11261

Mini-Review

Parathyroid crisis; a short look at an uncommon disease

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Abstract

Parathyroid crisis (storm), also known as parathyroid storm, is an extremely rare and life-threatening endocrine emergency caused by excessive secretion of parathyroid hormone (PTH). It is characterized by sudden and severe hypercalcemia, which can lead to multi-organ dysfunction and failure. This review paper aims to provide an in-depth understanding of parathyroid crisis, including its pathophysiology, clinical presentation, diagnosis, and management options.

Keywords: Parathyroid crisis, Parathyroid storm, Hypercalcemia, Parathyroid adenoma, Parathyroidectomy

Please cite this paper as: Tajdini P, Mazaheri Tehrani S, Vahdani Y. Parathyroid crisis; a short look at an uncommon disease. J Parathyr Dis. 2024;12:e11261. doi:10.34172/jpd.2024.11261.

Introduction

Parathyroid crisis/storm is a rare but life-threatening condition characterized by severe hypercalcemia and associated symptoms (1,2). This review paper aims to provide an overview of the current understanding of parathyroid crisis/storm, including its etiology, clinical presentation, diagnosis, and management. Additionally, we discuss the challenges in diagnosing this condition due to its rarity and similarities with other hypercalcemic disorders. The importance of early recognition and prompt intervention is emphasized to prevent potentially fatal complications. Finally, we highlight the need for further research to improve our understanding of parathyroid crisis/storm and develop effective treatment strategies.

Search strategy

For this review, we searched PubMed, Web of Science, EBSCO, Scopus, Google Scholar, Directory of Open Access Journals (DOAJ) and Embase, using different keywords including; parathyroid crisis, parathormone, parathyroid storm, hypercalcemia, parathyroid adenoma and parathyroidectomy.

Parathyroid storm

Parathyroid glands play a pivotal role in maintaining calcium homeostasis in the body through the secretion of parathyroid hormone (PTH) (3,4). However, in a parathyroid crisis, there is an exaggerated release of PTH, resulting in a rapid increase in serum calcium levels. Parathyroid crisis (storm) is mostly associated with parathyroid adenomas, but it can also occur due to hyperplasia or carcinoma of the parathyroid glands (1,5). The exact mechanisms triggering this life-threatening condition are not fully understood, however, some etiopathological factors are as follows:

Etiology and pathophysiology

The common etiology of parathyroid crisis (storm) is the presence of a parathyroid adenoma or multiple adenomas causing primary hyperparathyroidism. Other less common causes include parathyroid carcinoma, parathyromatosis, and parathyroid hyperplasia (6,7). The pathophysiology involves excessive secretion of PTH, resulting in persistent hypercalcemia, impaired renal function, and overall disruption of calcium homeostasis. The sudden elevation of calcium levels leads to multi-organ dysfunction and clinical manifestations observed in parathyroid crisis (storm) (1,7).

Clinical presentation of parathyroid storm

Parathyroid crisis presents with a wide range of symptoms, including severe abdominal pain, nausea, vomiting, constipation, skeletal pain, altered mental status, polyuria, and dehydration. The severity of symptoms varies depending on the degree and rapidity of hypercalcemia. Prompt recognition and diagnosis of parathyroid crisis are

Received: 28 January 2024, Accepted: 24 April 2024, ePublished: 1 June 2024

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Implication for health policy/practice/research/medical education

Parathyroid crisis (storm) is a rare but potentially life-threatening condition that requires prompt recognition and intervention. Early diagnosis is challenging due to its rarity and overlapping features with other hypercalcemic disorders. Further research is needed to enhance our understanding of this condition and develop effective treatment strategies to improve patient outcomes.

crucial for initiating immediate intervention (1,5).

Diagnosis of parathyroid storm

Diagnosing parathyroid crises involves a combination of clinical suspicion, laboratory tests, and imaging studies. Key laboratory findings include hypercalcemia, elevated PTH levels, and suppressed levels of phosphorus. Imaging techniques, such as ultrasound, computed tomography, and scintigraphy, can help identify the underlying parathyroid lesion and guide surgical management (8,9).

Management of parathyroid storm

The management of parathyroid crisis involves a multidisciplinary approach, including endocrinologists, surgeons, and intensive care specialists. Initial measures include aggressive hydration, loop diuretics, and bisphosphonates to stabilize calcium levels. In severe cases, hemodialysis or continuous venovenous hemofiltration may be necessary (1,10). Definitive treatment consists of parathyroidectomy, which can be performed through traditional open surgery or minimally invasive techniques, depending on the patient's condition and surgeon's expertise (11,12).

Prognosis of parathyroid storm

Early recognition and appropriate management are crucial in improving survival rates among patients with parathyroid crisis. Mortality rates remain high, especially in cases of delayed diagnosis or inadequate treatment (8,13). Adequate follow-up, regular monitoring of calcium levels, and appropriate calcium and vitamin D supplementation are essential to prevent recurrence and complications (14,15).

Conclusion

The parathyroid crisis is a life-threatening endocrine emergency characterized by severe hypercalcemia. Prompt recognition, diagnosis, and aggressive management are vital for improving patient outcomes. This review paper provides an updated understanding of parathyroid crisis, aiding clinicians in diagnosing and managing this rare condition effectively.

Authors' contribution

Conceptualization: Yasaman Vahdani.
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Validation: Parisa Tajdini, Yasaman Vahdani.
Visualization: Parisa Tajdini.
Writing–original draft: Parisa Tajdini, Yasaman Vahdani.
Writing–review and editing: Yasaman Vahdani.

Conflicts of interest

The authors declare that they have no competing interests.

Ethical issues

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

Funding/Support

None.

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