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### CLINICAL CHARACTERISTICS AND MANAGEMENT OF PATIENTS WITH SEVERE HYPERCALCEMIA IN HOSPITAL PUTRAJAYA

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#### INTRODUCTION

Severe hypercalcemia, defined as serum calcium  $>3.5$  mmol/L, is an endocrine emergency. It is associated with high morbidity and mortality especially in those with inappropriate management of hypercalcemia.

#### METHODOLOGY

Retrospective analysis was performed to identify patients with serum-corrected calcium of  $>3.5$  mmol/L based on biochemical test done in Hospital Putrajaya from January 2018 to April 2023. Those with more than 1 abnormally high serum calcium were included and analysed for characteristics, presentation, treatment and outcome of hypercalcemia.

#### RESULT

Forty-three patients with severe hypercalcemia were analyzed. The majority of patients were female (62.8%), with a median age of 62 years (IQR 51-68 years). Thirty-seven out of 43 patients were symptomatic at presentation, with 11 patients presenting with neurologic symptoms. Median corrected calcium at presentation was 3.87 mmol/L (IQR 3.65-4.28 mmol/L), phosphate 1.27 mmol/L (IQR 1.01- 1.66) and eGFR 38 ml/min per 1.73 m<sup>2</sup> (IQR 23.3-60).

Hypercalcemia of malignancy (HCM) accounts for 51.2% of total cases, overmedication with calcium/ Vitamin D supplements (34.9%), parathyroid adenoma (4.7%), tuberculosis (2.3%) and others (6.9%). Sixteen patients received bisphosphonate therapy (mean calcium reduction of 0.89 mmol/L in 5 days), 3 patients received calcitonin alone (mean calcium reduction of 1.9 mmol/L in 5 days), 3 patients treated with bisphosphonate and calcitonin (mean calcium reduction 1.12 mmol/L in 5 days) and 2 treated with denosumab and calcitonin (mean calcium reduction of 0.98 mmol/L in 5 days). Patients with persistent hypercalcemia  $>3$  mmol/L post-therapy were associated with higher mortality ( $p=0.018$ ). There was no difference in presenting symptoms, presentation calcium level, alkaline phosphatase, creatinine and eGFR between patients and their mortality outcome.

#### CONCLUSION

This analysis highlighted the discrepancy in the management of severe hypercalcemia before the release of the recent Endocrine Society Clinical Practice Guideline on the Treatment of Hypercalcemia of Malignancy. In this analysis, only a small proportion of patients received combination therapy of Calcitonin with Bisphosphonate/ Denosumab in managing severe hypercalcemia, resulting in persistent hypercalcemia and higher mortality risk.