Service Priorities and Programmes

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Medical emergency- Thyrotoxic periodic paralysis - how well did we manage?

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Introduction

Thyrotoxic periodic paralysis (TPP) is an alarming and potentially fatal medical emergency, yet this condition is totally reversible. The hallmark of the disease is profound hypokalemia. The time of hypokalemia should be as shortened as possible to avoid the malignant arrhythmia. Limited data is available to guide the medical management given the rarity of the disease.

Objectives

This study aims to identify the characteristics of patients with TPP in our locality and explore if there is any factor that may shorten the period of hypokalemia.

Methodology

This study was a retrospective analysis conducted in a hospital in Hong Kong. 42 episodes (38 patients) with a diagnosis of TPP over March 2010- March 2015 were recruited. All subjects were hospitalized in Queen Elizabeth Hospital. The cases were identified from the CDARS and endocrine registry. Outcome variables included potassium level at baseline and its trend, time required to normalize the potassium level, hypokalemia-related ECG changes and malignant arrhythmia. Statistical analysis was performed using SPSS 17.0. All continuous variables were expressed as either mean ± SD (for parametric data) or median (range) (for non-parametric data). Chi-square was applied to test for the independence between categorical variables. Mann Whitney U test was used to compare the means of the continuous variables for non-parametric data. Binary logistic regression was used to identify independent association. $P < 0.05$ was considered significant.

Result

37 male and 1 female patients were analyzed. 4 patients were readmitted during the cohort period, summing up 44 episodes of TPP for analysis. The top two months for hospital admission were May and June, reflecting TPP is more prevalent in summer time. Three peaks of admission time were observed at 07:00, 13:00, 21:00, possibly related to sleeping and meals. The average age was 35.5 ± 10.4. 25 out of 42 (59.5%) of patients had history of previous attacks of lower limb weakness. 59.5% of patients

did not have any past history of hyperthyroidism and none of them had family history of TPP. 85.7% of patients could not walk on admission. The average length of stay was 4.6 ±3.1 days. The average potassium and thyroid function were 2.38±0.62 mmol/L and 47.8±22.2 pmol/L. U wave, one of the hypokalemia related ECG features were identified in 69.2% cases. Three patients had atrial fibrillation documented in ECG. None patients had malignant arrhythmia. The average time and potassium supplement to correct potassium level was 444 minutes and 107 mmol respectively. Intensive care unit care was received in 11 episodes. It was found that regular use of beta-blocker was associated with shortened time to normalize K (p=0.04) i.e. 160 minutes shortened if beta-blocker was given on a regular basis. 15 episodes had rebound hyperkalemia and 5 required medical treatment of hyperkalemia. Low potassium and high creatinine kinase at baseline were independent risk factors of rebound hyperkalemia. 11 episodes of rebound hyperkalemia occurred in the first day after admission. Conclusions: Treatment of TPP with regular use of beta-blocker is effective in shortening the period of hypokalemia. Cautions should be exercised to avoid rebound hyperkalemia during replacement of hypokalemia, particularly in the first day after admission in patients with high creatinine kinase and severe hypokalemia. Early and regular prescription of beta-blocker together with close monitoring of potassium should be advocated in patients with TPP.