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Electrolytes Imbalance in Saltwater Near-Drowning Victims in the Gulf of Thailand

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Abstract

Background: Near-drowning victims in saltwater are expected to have multiple electrolytes imbalance that affected treatment outcome. There are limited data about these parameters in Thailand to guide the treatment plan.

Objective: To study the characteristic of electrolytes imbalance in saltwater near-drowning victims in the Gulf of Thailand.

Material and Method: Retrospective analytic study of 39 medical records of near-drowning patients admitted to Burapha University Hospital between 2000 and 2010. Characteristics of the patients and serum electrolytes were analyzed by SPSS version 19 for windows.

Results: The study included 23 male, 16 female patients. Average age was 14.46 ± 11.15 years and 19/39 (48.72%) patients were aged 10 or less. The following electrolytes imbalance were identified, hypokalemia 8/39 (20.51%), hypernatremia 12/39 (30.77%), hyperchloremia 15/39 (38.46%), high anion gap 23/39 (58.97%), and hypobicarbonatemia 28/39 (71.79%). Seven out of eight patients in the hypokalemia group were in the high anion gap group. Mean SpO₂ in the patients who had high anion gap was significantly lower than those who had normal anion gap ($87.06 \pm 17.68\%$ vs. $95.8 \pm 5.94\%$ $p = 0.031$) without difference in systolic blood pressure (112.59 ± 14.63 vs. 105.67 ± 13.98 $p = 0.159$). Those who were hypotensive significantly had lower bicarbonate (17.00 ± 3.51 vs. 20.59 ± 3.81 $p = 0.038$) and higher anion gap (19.29 ± 1.799 vs. 16.25 ± 6.25 $p = 0.025$) than normotensive patients.

Conclusion: Hypobicarbonatemia, high anion gap, hypernatremia, and hypokalemia were common in saltwater near-drowning patients in the Gulf of Thailand. The cause of high anion gap was probably due to hypoxia and hypotension.

Keywords: Saltwater near-drowning, Electrolytes imbalance, Hypernatremia, High anion gap, Gulf of Thailand

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