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Association between delta anion gap/delta bicarbonate and outcome of surgical patients admitted to intensive care

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Introduction: There is an expected relationship between Anion Gap (AG) elevation and serum bicarbonate variation (deltaBic).(1) Thus, we can assess whether there are other associated metabolic disorders by calculating deltaAG/deltaBic.(1) Altered values can indicate early on whether there are other associated disorders and suggest possible etiologies with more accuracy and appropriate care.(2)

Objective: We aimed to characterize the metabolic acidosis and its associations in surgical patients with possible complications related to this problem.

Methods: Involved patients in the postoperative period in 3 Intensive Care Units (ICUs) of tertiary hospitals and evaluated laboratory tests on admission and after 24h. Patients with different metabolic acidosis disorders and the deltaAG/deltaBic ratio were compared with each other regarding ICU complications and 30-day mortality. To patients with metabolic acidosis and elevated AG after 24h the deltaAG/deltaBic ratio was applied and separated into 3 groups: metabolic acidosis with elevated AG without associated disorders, metabolic acidosis with elevated AG associated with hyperchloremia and metabolic acidosis with elevated AG associated with alkalosis.

Results: We evaluated 621 surgical patients admitted to ICU, with 321 (51.7%) with some type of acidosis. After 24 hours, 140 patients remained with metabolic acidosis with elevated AG. These 140 patients were submitted to deltaAG/deltaBic calculation, and separated into 3 groups: first group with 101 patients and deltaAG/deltaBic association <1.0 (associated hyperchloremia), second with 18 patients and deltaAG/deltaBic of 1.0 to 1.6 (no mixed disorder), and the group with deltaAG/deltaBic >1.6 (associated with alkalosis) with 21 patients. In patients with metabolic acidosis with elevated AG without associated disorders there was a higher proportion of cardiovascular complications (p=0.001) compared to patients with mixed disorders. In addition, the mortality of patients with deltaAG/deltaBic between 1 - 1.6 was the highest (44.4%) of the groups evaluated.

Conclusion: deltaAG/deltaBic is useful to evaluate possible mixed disorders of metabolic acidosis with increased AG.

REFERENCES

1. Rastegar A. Use of the DeltaAG/DeltaHCO3- ratio in the diagnosis of mixed acid-base disorders. J Am Soc Nephrol. 2007;18(9):2429–31.
2. Kraut JA. Disturbances of acid-base balance and bone disease in end-stage renal disease. Semin Dial. 2000;13(4):261-6.

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