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Hyponatremia: evaluating the correction factor for hyperglycemia.

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Abstract

PURPOSE: There are no controlled experimental data that assess the accuracy of the commonly used correction factor of a 1.6 meq/L decrease in serum sodium concentration for every 100 mg/dL increase in plasma glucose concentration. The purpose of this study was to evaluate experimentally the hyponatremic response to acute hyperglycemia.

SUBJECTS AND METHODS: Somatostatin was infused to block endogenous insulin secretion in 6 healthy subjects. Plasma glucose concentrations were increased to >600 mg/dL within 1 hour by infusing 20% dextrose. The glucose infusion was then stopped and insulin given until the plasma glucose concentration decreased to 140 mg/dL. Plasma glucose and serum sodium concentrations were measured every 10 minutes.

RESULTS: Overall, the mean decrease in serum sodium concentration averaged 2.4 meq/L for every 100 mg/dL increase in glucose concentration. This value is significantly greater than the commonly used correction factor of 1.6 ($P = 0.02$). Moreover, the association between sodium and glucose concentrations was nonlinear. This was most apparent for glucose concentrations >400 mg/dL. Up to 400 mg/dL, the standard correction of 1.6 worked well, but if the glucose concentration was >400 mg/dL, a correction factor of 4.0 was better.

CONCLUSION: These data indicate that the physiologic decrease in sodium concentration is considerably greater than the standard correction factor of 1.6 (meq/L Na per 100 mg/dL glucose), especially when the glucose concentration is >400 mg/dL. Additionally, a correction factor of a 2.4 meq/L decrease in sodium concentration per 100 mg/dL increase in glucose concentration is a better overall estimate of this association than the usual correction factor of 1.6.

Comment in

[Hyponatremia: evaluating the correction factor for hyperglycemia.](#) [Am J Med. 2000]

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