

中文題目:血清血鈉值在高血糖病人中與死亡率以及臨床預後的相關性

英文題目: Association of Serum Sodium Level with Mortality and Outcomes in Hyperglycemia

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Background: Hyperglycemic patients are mostly mild hyponatremic. But some patients with marked osmotic diuresis may present with normal or even elevated serum sodium level, especially in elderly individuals with impaired thirst mechanism or diminished access to fluids. Hyponatremia is associated mortality rate as high as 40-60%, mostly due to the severity of the associated underlying disease process. We observed that patients with higher serum sodium level seemed to have poorer clinical outcomes during clinical practice, but the correlation have not been discussed yet. This study aimed to discuss the clinical outcomes according to the different serum sodium levels in the hyperglycemic patients.

Method: Patients with blood glucose levels higher than 500mg/dL who visited ED of a medical center in Taiwan between July 1, 2008 and September 30, 2010 were recruited retrospectively. The corrected sodium level was according to the glucose level, with a correction factor of 2.4, which meant a 2.4 meq/L decrease in sodium concentration per 100 mg/dL increase in glucose concentration. The participants were divided to 4 equal-sized groups for corrected sodium level, defined as over-correction (<141mmol/L), well-correction (141 - <146mmol/L), under-correction (146 - <151mmol/L), and severe under-correction (\geq 151mmol/L). Baseline characteristics and clinical outcomes were compared among the groups. The cumulative survival according to the corrected serum sodium concentration was estimated by Kaplan-Meier curves.

Results: A total of 732 hyperglycemic patients were included in this study. The 90-day all-cause mortality of these patients was 14.6% (107 patients). Patients with higher corrected sodium levels tended to be older, higher hemoglobin, BUN, creatinine, osmolality, and lower ALT level. Compared with the reference group of well-correction group, severe under-correction group have significantly higher rate of respiratory failure (24.1% versus 11.7%, $p = 0.001$), admission rate (96.3% versus 84.0%, $p = 0.002$), and ICU admission rate (53.7 % versus 19.7%, $p = <0.001$). 90-day mortality was twice as great for severe under-correction group (21.3%; multivariable adjust OR, 1.90; 95% CI, 1.09-3.31).

Conclusion: Among patients with hyperglycemia, patients with corrected sodium levels higher than 151mg/dL had highest rate of respiratory failure, admission rate, ICU admission rate, and 90-day mortality. Corrected sodium level could be used as a marker for 90-day mortality in hyperglycemic patients.