

KSN 2016 Abstract Submission

Transplantation & Immunology

KSN2016ABS-1570

Serum bicarbonate and long-term outcomes in kidney transplant recipients

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Background: Metabolic acidosis indicated by low serum bicarbonate (TCO₂) level has been known as a risk factor for mortality and progressive renal dysfunction in patients with chronic kidney disease. Nevertheless, studies concerned with the effect of metabolic acidosis in kidney transplant recipients (KTRs) are scarce.

Methods: We analyzed 3,117 adult KTRs between 1997 and 2012. Participants were categorized into low (less than 22 mEq/L) versus high TCO₂ group based on serum TCO₂ level at 3 and 6 months posttransplant. All-cause mortality and graft failure rate between different TCO₂ level groups were compared.

Results: Significant increase in all-cause mortality was observed in patients with low TCO₂ level at three ($P = 0.001$) and six months ($P = 0.004$) compared to those with high TCO₂ level. After adjustment for several factors including age, sex, diabetes, hypertension, relation with kidney donor, transplant era, estimated glomerular filtration rate, and history of acute rejection, low serum TCO₂ level at three (HR 2.04, 95% CI 1.28, 3.26) and six months (HR 2.08, 95% CI 1.12, 3.85) was associated with increased hazards for death. Also, participants in low TCO₂ group at three (HR 1.67, 95% CI 1.20, 2.31) and six months (HR 1.51, 95% CI 1.03, 2.23) were more likely to experience graft failure.

Conclusion: Low TCO₂ level can be a predictor of increased mortality and graft failure among KTRs irrespective of glomerular filtration rate. Further investigation is needed to evaluate the effect of metabolic acidosis and benefit of bicarbonate supplementation in KTRs.

Keywords: Transplant