KSN 2017 Abstract

KSN-17-P074

The additive value of serum anion gap and pH for mortality in patients receiving concomitant continuous renal replacement therapy and extracorporeal membrane oxygenation

Jin hyuk PAEK[1], Hyoungnae KIM[2], Anna LEE[1], Seokwoo PARK[1], Ho jun CHIN[1], Ki young NA[1], Hajeong LEE[3], Jung tak PARK[2], *Sejoong KIM[1]

[1]Internal Medicine, Seoul National University Bundang Hospital, Korea,South, [2]Internal Medicine, College of Medicine, Institute of Kidney Disease Research, Yonsei University, Seoul, Korea, Korea,South, [3]Internal Medicine, Seoul National University Hospital, Seoul, Korea, Korea,South

Objectives : An increased serum anion gap is known as a risk factor for hypertension, decreased renal function and mortality in critical illness. This study aimed to investigate whether serum anion gap and pH might be predictive of mortality in patients receiving continuous renal replacement therapy (CRRT) and extracorporeal membrane oxygenation (ECMO).

Methods : This multicenter retrospective cohort study included 307 patients who received CRRT and ECMO between April 2005 and April 2016. The albumin and blood urea nitrogen-adjusted anion gap (AGc) was calculated using this formula : AGc (mmol/L) = serum sodium (mmol/L) − (serum chloride (mmol/L) + serum bicarbonate (mmol/L)) + ([4 − serum albumin (g/dL)] x 2.5) − ([blood urea nitrogen (mg/dL) − 15] ÷ 7)

Results : Among 307 patients, 204 patients died (66.4%). According to the receiver operating characteristic curve analysis, the optimal threshold of AGc and pH for mortality were 14.75 mmol/L (sensitivity 0.782 and specificity 0.434) and 7.34 (sensitivity 0.718 and specificity 0.491). Multivariate analysis showed that patients with AGc above 14.75 mmol/L had 1.5 times higher risk of mortality (HR, 1.533; 95% CI, 1.047-2.244; P = 0.028) and patients with pH below 7.34 had 1.9 times higher risk of mortality (HR, 1.869; 95% CI, 1.308-2.670; P = 0.001). Patients with AGc ≥ 14.75 and pH < 7.34 increased the risk of mortality than patients with AGc < 14.75 and pH ≥ 7.34 (HR, 3.367; 95% CI, 2.094-5.412; P < 0.001). Whereas, albumin-adjusted anion gap did not show any significant predictive value for mortality.

Conclusions : This study showed that AGc and pH may have independent prognostic values and additive effects on mortality in patients receiving CRRT during ECMO.

Keywords : CRRT, ECMO, anion gap, pH, mortality