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Risk Factors for Mortality in Patients with Acute Kidney Injury Treated with Continuous Renal Replacement Therapy

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Objectives : Continuous renal replacement therapy (CRRT) is a widely used treatment modality in hemodynamically unstable acute kidney injury (AKI) patients, but mortality rate of AKI is still high. We aim to identify the risk factors for mortality in CRRT-treated AKI patients.

Methods : As retrospective study, the data related with CRRT was collected since March 2010 till December 2015. The duration of CRRT, AKIN criteria by creatinine or urine volume, presence of complete anuria, BUN and creatinine ratio, bilirubin, mean blood pressure (BP), systolic BP and other comorbidities were analyzed to know which factors associated with death.

Results : CRRT was applied to 184 patients due to AKI among the total number of 838 CRRT users.

Among the various variables, creatinine (2.87 ± 1.34 vs. 3.92 ± 2.6 mg/dL), creatinine ratio changes (2.89 ± 1.4 vs. 4 ± 2.9), lowest mean BP (67.07 ± 14.01 vs 75.45 ± 16.07 mmHg) and systolic BP (90.02 ± 19.24 vs. 105.27 ± 20.7 mmHg) were lower and bilirubin (6.13 ± 7.86 vs. 1.93 ± 1.98) was higher in non-survival group (N= 164) than survival group (N=20). The bilirubin ($r = 0.24$, $p = 0.001$) and systolic BP ($r = -0.25$, $p = 0.01$) were only correlated with death in multivariable analysis. The relative risk was 4.54 with septic shock ($r = 0.22$, $p = 0.001$) and 6.06 with malignancy ($r = 0.16$, $p = 0.008$). In subgroup analysis with non-survival group, total CO₂ contents (16.1 ± 6.2 vs 18.4 ± 4) and systolic BP (84.3 ± 17.9 vs 92.7 ± 19) were lower in death within 48 hours group. The relative risk was 3 with malignancy ($r = 0.26$, $p = 0.001$) and 1.48 with septic shock ($r = 0.08$, $p = 0.275$).

Conclusions : Patients with CRRT are very fragile regardless of their causes and have high mortality risk. According to our study, the time to CRRT (early or late) did not affect survival. However, comorbidity especially malignancy, other organ damage and systolic blood pressure were closely related with mortality than the level of AKI damage.

Keywords : Acute kidney injury, mortality, renal replacement therapy