

Albumin Level Modifies Paradoxical Effect between BMI and Mortality in AKI Patients Undergoing CRRT

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Background: Nutritional status is generally accepted as a factor to explain the paradoxical association between high body mass index (BMI) and survival benefit in critical ill patients. Patients with acute kidney injury (AKI), particularly those receiving continuous renal replacement therapy (CRRT), are highly catabolic and more susceptible to loss of energy. Thus, we aimed to investigate the relationship between albumin level, BMI, and mortality in these patients. **Methods:** We conducted an observational study in 573 patients who had undergone CRRT owing to various causes of AKI between 2010 and 2014. Patients were divided into quartiles according to BMI : Q1, 12.7 - 20.9; Q2, 21.0 - 23.5; Q3, 23.6 - 26.5; Q4, 26.6 - 45.3 and also classified into two groups by albumin (albumin < 3.0g/dL or ≥ 3.0g/dL) in each quartile. The study end point was defined as death that occurred within 30 days after the initiation of CRRT. **Results:** The mean age was 61.5 years and 355 (63.1%) patients were male. The mean levels of BMI and albumin were 23.9±4.3 kg/m² and 2.6±0.6 g/dL, respectively. Kidney function, comorbidity index, and sepsis-related organ failure assessment (SOFA) score were not significantly different among the BMI quartile groups. During 30 days after the initiation of CRRT, 85 patients (59.4%) died in the highest quartile as compared with 106 patients (73.6%) in the lowest quartile ($p=0.012$). In a multivariable analysis adjusted for sex, blood pressure, estimated glomerular filtration rate, sepsis, age adjusted Charlson comorbidity score, SOFA score, albumin and white blood cell count, CRRT prescription, the highest quartile of BMI was associated with a decreased risk of death [hazard ratio (HR), 0.61; 95% confidence interval (CI), 0.46-0.82; $p=0.001$]. This association remained unaltered in low albumin group (HR, 0.58; 95% CI, 0.41-0.80; $p=0.001$), whereas no such relationship was seen in high albumin group (HR, 0.72; 95% CI, 0.35-1.48; $p=0.37$). **Conclusions:** This study showed that a protective effect of high BMI was observed in AKI patients undergoing CRRT only in patients with low albumin levels, and this effect was lost in patients with higher albumin levels.

Coagulopathy reduces dialyzer clotting in CRRT

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Introduction: CRRT needs continuous systemic anticoagulation to maintain extracorporeal circuit because the circuit is frequently interrupted by dialyzer clotting. We aim to investigate which conditions contribute to frequent dialyzer clotting and dialyzer lifespan. **Methods:** We investigated retrospectively the medical records of thirty patients who had been received CRRT from March to September in 2015 at Yonsei Wonju Severance Christian Hospital. CRRT modes were all veno-venous hemodiafiltration. We investigated clinical situations, CRRT prescriptions and basic blood tests including DIC (disseminated intravascular coagulation) profile. Dialyzer lifespan was calculated as: CRRT maintenance time (hours) divided by the frequency of dialyzer membrane clotting. **Results:** The results showed that D-dimer and FDP(fibrin degradation product) had significant positive correlations with dialyzer lifespan respectively ($r=0.38$, $p=0.048$ / $r=0.40$, $p=0.041$), while hemoglobin, platelet count, PT(prothrombin time) and activated PTT(partial thromboplastin time) did not show the relationship with dialyzer lifespan. Transfusion of packed RBC(red blood cell), FFP(fresh frozen plasma) and platelet concentrate did not show the relationship with dialyzer lifespan. CRRT prescription including CRRT dose, blood flow and type of anticoagulation had no correlation with dialyzer lifespan. When compared with non-DIC group ($n=20$), DIC group ($n=10$) had longer dialyzer lifespan, but not statistically significant (DIC vs. non-DIC, 47.98±19.48 vs. 33.38±18.25 hours, $p=0.052$). When compared with non-sepsis group ($n=11$), sepsis group ($n=19$) had shorter dialyzer lifespan significantly (sepsis vs. non-sepsis, 32.15±16.12 vs. 48.77±21.34 hours, $p=0.022$). **Conclusions:** Our study indicates that CRRT dialyzer could be longer used without clotting in the case of coagulopathy, while dialyzer clotting is more frequent in sepsis. Transfusion, clinical severity and CRRT prescription had no relationship with dialyzer clotting. We believe that bleeding diathesis by coagulopathy reduces the dialyzer clotting, further investigation is required to determine clinical implication.