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Safety and clinical efficacy of plasma-saving membrane-based therapeutic plasma exchange in critically ill patients undergoing continuous kidney replacement therapy

Jae Sung Ahn[1], Chan-Young Jung[1], Tae Hyun Kim[2], Seul Gi Shin[2], A Reum Kim[2], Soo-Yeon Kim[2], Jin Hee Han[2], Jai Won Chang[1]
[1]Department of Internal Medicine-Nephrology, Asan Medical Center, University of Ulsan College of Medicine, Korea, Republic of
[2]Department of Nursing, Asan Medical Center, University of Ulsan College of Medicine, Korea, Republic of

Objectives: Membrane-based therapeutic plasma exchange (mTPE), which eliminates endotoxins, cytokines, and pathogenic antibodies, may be beneficial in critically ill patients. This study aimed to evaluate the safety and clinical of mTPE in the treatment of critically ill patients undergoing continuous kidney replacement therapy (CKRT).

Methods: In this retrospective observational study, patients with catecholamine-resistant septic shock and multiple organ failure were screened. A total of 118 mTPE sessions applied in 60 patients were evaluated. Study outcomes included bleeding risk, safety, and survival.

Results: mTPE was relatively safe without the occurrence of any clinically significant bleeding events. Although there were significant changes in the aPTT, hemoglobin, and platelet levels after mTPE (all $P<0.05$), when the laboratory parameters were directly compared before each mTPE sessions, there were no significant differences (all $P>0.05$), and there were no occurrences of any clinically significant bleeding events. After each mTPE session, there was a significant decrease in CRP levels ($P<0.05$). The 28-day mortality rate was 46.7%. When patients were stratified into sequential organ failure assessment (SOFA) score categories (1: 0-9; 2: 10-11; 3:12-14; 4:15-24), the predicted mortality for each group was 10.0% vs. 45.8%, vs. 80.0% vs. 89.7% for groups 1 to 4, respectively. The observed 28-day mortality for each group was 22.2% vs. 0.0% vs. 11.1% vs. 67.6% for groups 1 to 4, respectively.

Conclusions: mTPE applied in critically ill patients undergoing CKRT appeared to be relatively safe, with no bleeding events and lower 28-day mortality than predicted mortality.

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