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Usefulness of Polymyxin B Hemoperfusion in the Patients with Septic Acute Kidney Injury Requiring Continuous Renal Replacement Therapy

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Objectives: Polymyxin B hemoperfusion (PBH) may improve clinical outcomes in the septic patients with gram-negative bacteremia by reducing endotoxin level. However, it is unclear that PBH improves the survival rate in those patients in the recent studies. Therefore, we investigated whether adding PBH to continuous renal replacement therapy (CRRT) could improve survival rate, compared with CRRT alone, in them.

Methods: In this retrospective study, 231 septic patients underwent CRRT alone (n=155, M:F=91:64, age 67±14 years) or PBH with CRRT (n=76, M:F=44:32, age 60±15 years). The additional initiation of PBH was determined by the intensivist. Demographic data and biochemistry parameters were obtained by reviewing electronic medical records at the initiation of CRRT in CRRT alone group or PBH in PBH with CRRT group. Primary outcomes were 28-day and 90-day all-cause mortality.

Results: There were no significant differences between two groups in urine output (0.56±0.87 vs. 0.74±1.23 ml/Kg/h), ventilator use (89% vs. 85.5%), and SOFA score (14.1±2.6 vs. 13.7±4.1). Although the crude 28-day and 90-day mortality rate were higher in the PBH with CRRT group compared with those of CRRT alone group, inotropic score was significantly higher in the PBH with CRRT group (27.1±21.6 vs. 51.1±33.6, p<0.05). In order to correct disease severity, propensity score matching was performed with mean arterial pressure, inotropic score, and SOFA score. Mantel-Cox regression analysis of 49 propensity score matching pairs revealed still significantly higher 28-day and 90-day mortality rate of the PBH with CRRT group compared with those of CRRT alone group

Conclusions: Considering the mortality rates in this study, the additional use of PBH to CRRT does not seem to be effective in the improvement of clinical outcome in the septic patients with AKI requiring CRRT. In the future, randomized interventional trial is necessary whether the additional use of PBH to CRRT could improve the survival in them.

Table 1. Primary Outcomes of 28-Day and 90-Day Mortality

		CRRT only	PBH-CRRT	p-value	Risk Ratio	95% CI
Crude	28-Day	60/155 (38.7%)	40/76 (52.6%)	0.007	1.74	1.17-2.60
	90-Day	81/155 (52.3%)	46/76 (60.5%)	0.033	1.48	1.03-2.13
Propensity-matching	28-Day	20/49 (40.8%)	28/49 (57.1%)	0.026	1.93	1.08-3.44
	90-Day	22/49 (44.9%)	30/49 (61.2%)	0.025	1.88	1.08-3.27