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Outcomes of Continuous Renal Replacement Therapy Versus Peritoneal Dialysis as a Renal Replacement Therapy Modality in Patients Undergoing Extracorporeal Membrane Oxygenation

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Objectives : Continuous renal replacement therapy (CRRT) and peritoneal dialysis (PD) appear as suitable RRT modalities among acute kidney injury (AKI) patients undergoing Extracorporeal Membrane Oxygenation (ECMO). This study aimed to evaluate and compare the outcomes of patients on ECMO who receive these distinct modes of RRT.
Methods : We conducted a retrospective cohort study from February 2018 to December 2023 among ECMO-supported patients who developed AKI and subsequently required RRT. The patient cohort was categorized into two groups based on the RRT modality employed: CRRT and PD. Patient profiles and outcomes, including hospital mortality, length of stays, RRT and ECMO durations, and RRT complications, were analyzed and compared.
Results : A total of 43 patients, consisting of 21 treated with CRRT and 22 with PD during ECMO therapy, were included in the study. There was no statistically significant difference in in-hospital mortality rates between the two groups (80.9% in CRRT vs 90.9% in PD, p = 0.35). ICU and hospital lengths of stay were no difference. However, CRRT demonstrated a markedly lower rate of catheter malposition (4.7% vs. 31.8%, p = 0.046). The rates of catheter infection and catheter site bleeding were not statistically significant (4.7% in CRRT vs. 22.7% in PD, p = 0.19, and 9.5% in CRRT vs. 18.2% in PD, p = 0.66, respectively). Additionally, circuit clotting was observed in 38.1% of CRRT patients, while the incidence of PD leakage was 22.7%. The occurrences of refractory hyperkalemia and refractory metabolic acidosis demonstrated no significant differences between CRRT and PD (4.7% vs. 27.3% and 9.5% vs. 9.1%, p = 0.10, 0.61, respectively).
Conclusions : Among ECMO-supported patients receiving RRT, there was no difference between CRRT and PD in terms of in-hospital mortality and hospital length of stay. However, PD did exhibit a higher incidence of catheter-related complications.

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Table Outcomes and Complication of CRRT and PD during ECMO

	CRRT (N=21)	PD (N=22)	P-value
In-hospital mortality, n (%)	17 (80.9)	20 (90.9)	0.35
60-days mortality, n (%)	18 (85.7)	21 (95.45)	0.27
ICU lengths of stay, days	11 (6,15)	15 (9,25)	0.14
Hospital lengths of stay, days	18 (9,28)	24.5 (18,31)	0.22
RRT durations, days	4 (3,5)	7.5 (5,14)	**0.0007**
ECMO durations, days	6 (4,8)	5 (4,7)	0.63
Weaning from ECMO, n (%)	8 (38.1)	10 (45.5)	0.63
Complications, n (%)			
Catheter infection	1 (4.7)	5 (22.7)	0.19[f]
Catheter malposition	1 (4.7)	7 (31.8)	**0.046**[f]
Catheter site bleeding	2 (9.5)	4 (18.2)	0.66[f]
PD leakage	0 (0)	5 (22.7)	**0.048**[f]
Circuit clot	8 (38.1)	0 (0)	**0.034**[f]
Refractory hyperkalemia	1 (4.7)	6 (27.3)	0.10[f]
Refractory metabolic acidosis	2 (9.5)	2 (9.1)	0.61[f]

Data are presented as median (IQR) for continuous variables, and n (%) for categorical variables

P-value were calculated by Mann-Whitney U test, Chi-squared test, or Fisher's exact test (*f*) as appropriate