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Efficacy of Convection-based hemodiafiltration Compare with Diffusion-based Hemodialysis in Sepsis-associated Acute Kidney Injury: A Randomized Controlled Trial

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Objectives : Sepsis-associated acute kidney injury (SA-AKI) is a frequent complication in critically ill patients which is associated with higher morbidity and mortality. There are many inflammatory cytokines released during sepsis eg.IL-6 and CRP which higher levels are believed to be a predictor and associated with poorer outcomes.
Methods : SA-AKI patient were randomized into 2 groups for online hemodiafiltration (OL-HDF) and intermittent hemodialysis (IHD). Treatment time was 4 hours and prescription blood flow rate were 200 ml/min for both groups. In OL-HDF group 40L/session of substitution ultrapure fluid was added in predilution technique. Primary outcome are percent reduction of IL-6 and CRP at 4 hours and 48 hours after first dialysis session. Thirty-days mortality and kidney recovery are our secondary outcome.
Results : A total of 14 patients diagnosed with SA-AKI requiring dialysis, female 57.14%, mean age 67.86±16.21 years-old, hypertension 64.29%, diabetes 35.71%, mean eGFR 59.91±26.51 ml/min/1.73m^2. Primary infectious organs are pneumonia 64.29% and urinary tract infection 21.43%. Severity of sepsis determined by mean SOFA score 11.14±3.44 and mean APACHE-II score 22.50±3.78. Percent reduction of IL-6 and CRP after dialysis 4 hours was -4.99 vs -3.19, P=0.94 and -7.45 vs -1.71, P=0.83 in convection group and diffusion group respectively. Over-all 30 days mortality was 42.86%, while in-hospital death was 71.43%. Patients discharge with dialysis independent were 28.57% in both groups.
Conclusions : Patients diagnosed with SA-AKI who need dialysis has high mortality rate. In our study OL-HDF did not show significant efficacy for percent reduction of IL-6 or CRP compared with intermittent low-flux HD.

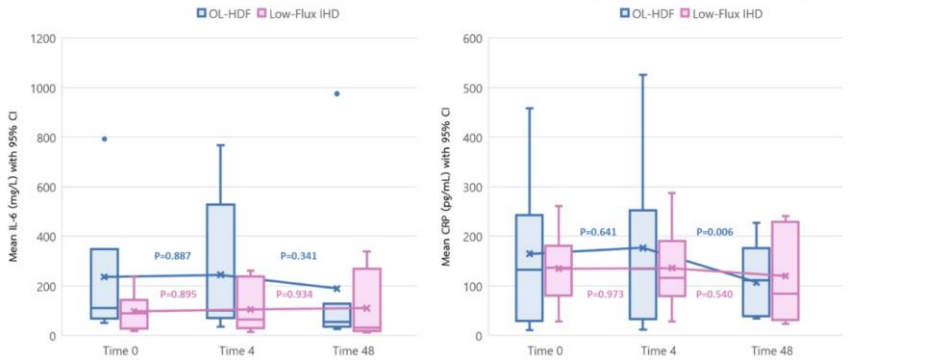
Table 2.jpg

	OL-HDF		Low-Flux IHD		P-value
	Percentage difference	[95% CI]	Percentage difference	[95% CI]	
IL-6					
• Time 0→4	-4.99	[-38.16,28.18]	-3.19	[-36.36,29.98]	0.940
• Time 0→48	43.14	[9.97,76.31]	3.15	[-30.02,36.32]	0.095
CRP					
• Time 0→4	-7.45	[-44.83,29.93]	-1.71	[-39.09,35.67]	0.831
• Time 0→48	-25.86	[-63.24,11.52]	15.81	[-21.57,53.19]	0.122

Time 0→4; mean percentage difference at KRT initiation vs 4 hours after treatment

Time 0→48; mean percentage difference at KRT initiation vs 48 hours after treatment

Table 2.jpg



	Mean IL-6 level (mg/L)				Mean CRP level (pg/mL)		
	Time 0	Time 4	Time 48		Time 0	Time 4	Time 48
OL-HDF	236.51 [80.92,392.10]	244.83 [89.24,400.41]	189.17 [33.59,344.76]		164.83 [84.36,245.30]	176.71 [96.24,257.18]	107.27 [26.81,187.74]
Low-Flux IHD	97.33 [-58.26,252.91]	105.04 [-50.54,260.63]	109.89 [-45.70,265.47]		134.97 [54.51,215.44]	135.82 [55.36,216.29]	120.23 [39.76,200.69]