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Clinical Outcomes of Hemoperfusion using HA330 Filter among patients with Severe and Critical COVID-19 at the University of Santo Tomas Hospital: A One Year Retrospective Study

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Objectives : The research aims to determine the clinical outcomes of patients with severe and critical COVID-19 who underwent hemoperfusion at the University and Santo Tomas Hospital.
Methods : This retrospective study included 135 severe and critical COVID-19 patients who underwent hemoperfusion using an HA330 cartridge. APACHE II score, hemoglobin, blood counts, serum creatinine, ferritin, hs-CRP, IL-6, LDH, procalcitonin, D-dimer, PaO2/FiO2 ratio were compared pre and post-hemoperfusion among survivors and non-survivors. The effects of the timing of hemoperfusion on clinical parameters and outcomes were described.
Results : APACHE II score was lower post-hemoperfusion compared to baseline levels among survivors. Post-hemoperfusion, hemoglobin, and platelet counts were lower among non-survivors. WBCs increased among all patients. Neutrophils increased while lymphocytes decreased among non-survivors. There is no significant change in creatinine compared to the baseline. Post-HP ferritin, LDH, and D-dimer were elevated among non-survivors. HsCRP and procalcitonin were lower while ferritin and D-dimer increased among survivors post-HP. IL-6 levels showed no significant difference post-HP but we reported higher levels among non-survivors versus survivors. PaO2/FiO2 ratio was higher among survivors versus non-survivors. The effect of the timing of hemoperfusion was divided within 14 days versus beyond 14 days of illness. APACHE II scores were lower for those who underwent hemoperfusion within 14 days. There was no significant difference compared to baseline levels of blood counts, inflammatory markers, and PaO2/FiO2 ratio among those who underwent hemoperfusion beyond 14 days. Hemoglobin, hs-CRP, IL-6, and procalcitonin were lower while neutrophils, ferritin, d-dimer, and PF ratio increased among those who had hemoperfusion within 14 days.
Conclusions : Hemoperfusion results in lower APACHE II scores, hemoglobin, HsCRP, and procalcitonin levels. There was no significant difference from baseline clinical parameters among those who underwent hemoperfusion beyond 14 days of illness. Those who underwent hemoperfusion within 14 days of illness required less invasive mechanical O2 support

Table 1.jpg

Table 1. Demographic and clinical profile of patients

	Mortality			P-value
	Total (n=135)	Expired (n=37, 27%)	Alive (n=98, 73%)	
	Frequency (%); Mean ± SD; Median (IQR)			
Age	62.57 ± 12.37	66.68 ± 11.22	61.02 ± 12.49	**0.017**
Sex				1.000
Male	87 (64.44)	24 (64.86)	63 (64.29)	
Female	48 (35.56)	13 (35.14)	35 (35.71)	
Diagnosis				**<0.001**
Severe COVID-19	84 (62.22)	3 (8.11)	81 (82.65)	
Critical COVID-19	51 (37.78)	34 (91.89)	17 (17.35)	
Comorbidities				
Hypertension	98 (72.59)	30 (81.08)	68 (69.39)	0.200
Diabetes mellitus	58 (42.96)	17(45.95)	41 (41.84)	0.700
CKD	33 (24.44)	19 (51.35)	14 (14.29)	**<0.001**
Cardiovascular disease	19 (14.07)	8 (21.62)	11 (11.22)	0.164
Cerebrovascular disease	14 (10.37)	6 (16.22)	8 (8.16)	0.207
Cancer	7 (5.19)	5 (13.51)	2 (2.04)	**0.017**
COPD	5 (3.7)	2 (5.41)	3 (3.06)	0.614
Chronic kidney disease				1.000
On hemodialysis	6 (18.18)	4 (21.05)	2 (14.29)	
On dialysis	27 (81.82)	15 (78.95)	12 (85.71)	
Days of illness on admission	8 (6 to 11)	8 (4 to 11)	8 (6 to 12)	0.329
Days of illness during hemoperfusion	10 (8 to 12)	10 (8 to 12)	10 (8 to 12)	0.913
≤ 14 days	122 (90.37)	31 (83.78)	91 (92.86)	0.186
>14 days	13 (9.63)	6 (16.22)	7 (7.14)	

Table 1.jpg

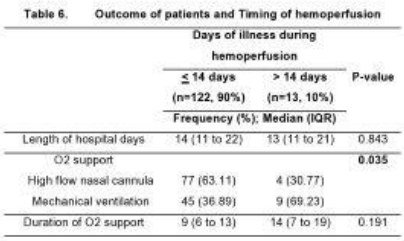

Table 6. Outcome of patients and Timing of hemoperfusion

	Days of illness during hemoperfusion		
	≤ 14 days (n=122, 90%)	> 14 days (n=13, 10%)	P-value
	Frequency (%); Median (IQR)		
Length of hospital days	14 (11 to 22)	13 (11 to 21)	0.843
O2 support			**0.035**
High flow nasal cannula	77 (63.11)	4 (30.77)	
Mechanical ventilation	45 (36.89)	9 (69.23)	
Duration of O2 support	9 (6 to 13)	14 (7 to 19)	0.191