MO655 ANTI-INFLAMMATORY APPROACH IN CHRONIC DIALYSIS PATIENTS WITH SARS-COV-2: ATA OR PMMA DIALYZERS?

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BACKGROUND AND AIMS: High flux haemodialysis membranes may modulate the cytokine storm of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), but their impact in chronic haemodialysis (CHD) patients is not assessed [1, 2]. The aim of the study was the evaluation of asymmetric cellulose triacetate (ATA) and polymethylmethacrylate (PMMA) dialyzers on inflammatory markers in CHD patients with SARS-CoV-2.

METHOD: A prospective, observational study on CHD patients (age ≥18 years) affected by SARS-CoV-2 was carried out. Patients were enrolled from March 2020 to May 2021 and dialysis was performed at S. Orsola University Hospital (Bologna, Italy) Dialysis Unit. Mechanical ventilation at diagnosis was exclusion criteria. Pre- and post-dialysis C-reactive protein (CRP), procalcitonin (PCT) and interleukin-6 (IL-6) were determined at each session and corrected for haemoconcentration during the complete SARS-CoV-2 period.

Patients who underwent online haemodiafiltration (OLHDF) with PMMA dialyzer (Filtryzer BG-U™, Toray, surface area 2.1 m^2, cut-off 20 kDa, KUF 43 mL/h/mmHg) were compared with those who underwent OLHDF with ATA dialyzer (Solacea™, Nipro, surface area 2.1 m^2, cut-off 45 kDa, KUF 72 mL/h/mmHg). The primary endpoint was to assess the differences in the reduction ratio/session (RR) of CRP, PCT and IL-6.

RESULTS: A total of 74 patients were enrolled, 48 were treated with ATA and 26 were with PMMA (420 versus 191 dialysis sessions). The main results are shown in Table 1. Median IL-6RR% was higher for ATA [17.08%, interquartile range (IQR) −9.0 to 40.0 versus 2.95%, IQR −34.63 to 27.32]. CRP and PCT showed higher RR with ATA in comparison to PMMA. When IL-6RR > 25% was the dependent variable in the multiple logistic regression analysis only ATA showed a significant correlation [odds ratio (OR) 1.891, 95% confidence interval (95% CI) 1.273–2.840, P = .0018) while higher CRP favoured the risk of lower IL6RR (OR 0.9101, 95% CI 0.868–0.949, P < 0.0001) (Table 2).

CONCLUSION: In SARS-CoV-2 CHD patients treated with OLHDF, ATA showed a better anti-inflammatory profile than PMMA, in particular regarding IL-6 RR.

Table 2. Multiple logistic regression with IL-6 RR > 25% as outcome. Odds Ratio (OR), Confidence interval (CI)

	OR	95% CI	*p*
ATA	1.891	1.273–2.840	**.0018**
IL-6 pre-HD	1.003	1.001–1.007	**.0123**
CRP pre-HD	0.9101	0.8682–0.9496	**< 0.0001**
PCT pre-HD	0.9528	0.8644–1.008	.2270
Ferritin	1.000	0.9998–1.000	.7697

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MO656 VALIDITY OF THE HYDROGEN ION MOBILIZATION MODEL DURING HAEMODIALYSIS WITH TIME-DEPENDENT DIALYSATE BICARBONATE CONCENTRATIONS

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BACKGROUND AND AIMS: The hydrogen ion (H^+) mobilization model has been previously shown to describe blood bicarbonate (HCO3) kinetics during haemodialysis (HD), but this model has only been evaluated when the dialysate HCO3 concentration ([HCO3]) was constant throughout the treatment [1]. To further assess the H^+ mobilization model, we tested its ability to describe blood HCO3 kinetics during HD treatments with a time-dependent dialysate [HCO3].

METHOD: The H^+ mobilization model describes the time dependence of blood [HCO3] assuming HCO3 is distributed in the extracellular fluid volume and removed from that space by mobilization of H^+ from buffers and other sources as previously described [1]. HCO3 transfer across the haemodialyzer during HD is assumed governed primarily by diffusion and the difference between dialysate and blood [HCO3]. In this work, we evaluated this model by comparing its predictions with data from a recent clinical study where blood [HCO3] was measured in 11 chronic, thrice-weekly HD patients (5 male, 6 female) during 4-h treatments with i) constant dialysate [HCO3] of 35 mEq/L; ii) dialysate [HCO3] of 35 mEq/L for the first 2-h and 30 mEq/L for the second 2-h; and iii) dialysate [HCO3] of 30 mEq/L for the first

Table 1. Clinical features and outcomes of ATA versus PMMA. Standard deviation (SD), Interquartile range (IQR)

	ATA (48)	PMMA (26)	*P*
Age, years, mean (SD)	67.67 (15.48)	69.46 (16.37)	.6421
Male, *n* (%)	34 (71)	17 (66)	.7930
HD age, months, median (SD)	47.00 (13.75–89.75)	27.50 (14.25–71.50)	.3653
Charlson Comorbidity Index, median (IQR)	4.00 (3.00–5.00)	5 (3.00 –7.25)	.2549
Arteriovenous Fistula, *n* (%)	39 (81)	14 (54)	**.0166**
Central venous catheter, *n* (%)	9 (9)	12 (46)	
Interstitial pneumonia, *n* (%)	29 (60)	20 (77)	.2008
Pre-HD IL-6 pg/mL, median (IQR)	14.50 (5.75–41.43)	13.90 (5.80–34.10)	.6386
IL-6 RR%, median (IQR)	17.08 (−9.0–40.0)	2.95 (−34.63–27.32)	**<0.001**
IL-6 RR% based on pre-dialysis IL-6 level (median, IQR)			
1st tertile	23.55 (−8.96–47.40)	3.72 (−51.66–30.08)	**.0013**
2nd tertile	16.69 (−9.79–39.39)	2.18 (−24.03–25.95)	**.0405**
3rd tertile	12.99 (−8.73–35.75)	1.14 (−34.70–31.33)	**.0501**
CRP RR%, median (IQR)	7.77 (2.47–13.77)	4.80 (−2.65–11.38)	**.0017**
PCT RR%, median (IQR)	77.38 (70.92–82.97)	54.59 (42.62–63.16)	**<0.0001**
Variables at diagnosis, median (IQR)			
IL6 pg/mL	20.30 (9.10–62.10)	22.60 (9.80–56.35)	.8763
CRP mg/dL	3.88 (0.77–143.70)	3.30 (0.33–9.98)	.4134
PCT pg/mL	1.60 (0.72–2.77)	0.95 (0.53–1.48)	**.0388**
Death, *n* (%)	8 (17)	5 (19)	.7604