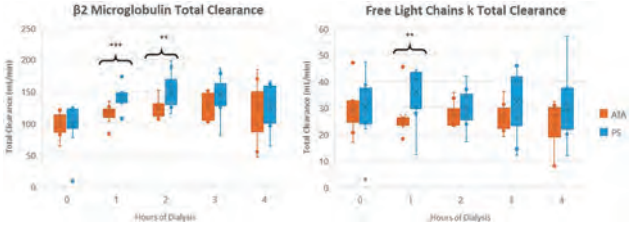
(Ktot p=0.015, S p=0.008). No significant Ktot and S variation was observed between filters at other time points (Figure 1).

**Conclusions:** Globally, removal performance of MMT is similar for both filters tested. Given the features of ATA membrane, which is predicted to be more biocompatible for hypersensitivity prone patients, slightly lower performances are observed in the first half of treatment. As a consequence, the choice of ATA membrane should be considered suitable for MMT removal in patients with hypersensitivity.




p<0.05 (**); p<0.01 (***)

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## TH-PO244

### Use of the Seraph 100 Dialysis Filter in a Patient with Toxic Shock Syndrome from Streptococcus pyogenes Bacteremia

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**Introduction:** The Seraph 100 Microbind Affinity Blood Filter (Seraph 100) is a hemoperfusion dialysis filter which employs pathogen adsorption therapy using heparin-coated polyethylene beads. Data exists supporting its effectiveness among COVID-19 patients where the filter was allowed under emergency use authorization by the FDA. It has been shown to bind various pathogens (with affinity for streptococcus pyogenes (GAS)), endotoxins and cytokines, allowing their removal from the bloodstream.

**Case Description:** A 26 year-old female who gave birth four days prior was admitted to the intensive care unit with high fevers and septic shock requiring 3 vasopressors causing severe lactic acidosis (to 11.6 mmol/L). For GAS bacteremia causing toxic shock syndrome (TSS) she received meropenem, clindamycin, and vancomycin. She suffered necrosis of her nose, fingers and toes as well as disseminated intravascular coagulation (DIC). She also suffered anuric renal failure requiring continuous renal replacement therapy (CRRT). Five days into hospitalization, despite emergent hysterectomy for source control, intravenous hydroxycobalamin, and methylene blue, she still required 3 vasopressors for persistent shock. The Seraph 100 filter was obtained and was installed in series with an M100 filter in a PrismaFlex dialysis machine. The day after installation, her shock completely resolved, then enabling fluid removal with CRRT and initiation of feeding. With shock resolved, her necrotic lesions showed some improvement and did not auto-amputate. Additionally, her DIC improved which enabled her to be treated with heparin for thrombi in distal extremities. Each night, clotting of the Seraph 100 filter would require its replacement the following day; in total 8 filters were used.

**Discussion:** This case demonstrates use of the Seraph 100 filter in a patient suffering from persistent GAS-related TSS after source control. By improving rapidly she avoided further complications of shock, including worsening of necrosis which may be attributed to vasopressor induced acute limb ischemia, as well as improved ultrafiltration enabling weaning off mechanical ventilation. No clear adverse events were attributed to use of this filter. Given the high mortality rate associated with TSS, future studies should evaluate for this filter's efficacy in improving outcomes for such patients.

## TH-PO245

### Changes in Coronary Artery Calcification Score in ESKD: Comparison of Hemodialysis and Online Hemodiafiltration

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**Background:** It has been shown that high-dose hemodiafiltration (OHDF) reduces the risk of all-cause mortality compared to conventional high-flux hemodialysis (HD) (N Engl J Med. 389: 700, 2023). The primary reason for this reduction was a decrease in infections. Still, there are also many reports that OHDF reduces the risk of cardiovascular death, a significant cause of mortality in dialysis patients, compared to HD (Nephrol Dial Transplant. 31: 978, 2016) (Cochrane Database Syst Rev. 2015: CD006258, 2015). The coronary artery calcification score (CACS), measured by multi-slice CT, has significant evidence linking it to cardiovascular events, and its usefulness has been reported in dialysis patients (Clin Exp Nephrol. 8: 54, 2004). In this study, we compared changes in CACS between standard HD treatment and OHDF treatment in maintenance dialysis patients.

**Methods:** A retrospective cohort study was conducted on hemodialysis patients who underwent CACS evaluation using CT at our institution from January 2018 to February 2021. Patients who did not undergo re-evaluation after one year and those with a logarithmically transformed initial Agatston CACS of less than 100 were excluded. The patients were classified into the HD treatment group and the OHDF treatment group. Propensity score matching was performed based on age, sex, dialysis vintage, presence of diabetes, Ca, P, Mg, TSAT levels, and initial Agatston CACS. The aim was to examine whether there was a difference in the change rate of the Agatston CACS after one year between the HD and OHDF groups. The data were presented as medians and interquartile ranges, and JMP16 was used for analysis. Pearson's chi-square and Mann-Whitney U tests were used for statistical testing.

**Results:** Of the 560 patients who underwent CACS evaluation during the study period, 263 were included in the study. Through propensity score matching, 49 patients were selected for each group. No significant differences were observed in the baseline characteristics between the groups. The median increase rate of the Agatston CACS after one year was 15.8% (interquartile range 3.2 - 37.2) in the HD group and 6.6% (0.6 - 17.2) in the OHDF group (p = 0.02).

**Conclusions:** OHDF may suppress coronary artery calcification compared to HD in patients with end-stage renal disease.

## TH-PO246

### Hemoperfusion Is Associated with Reduced Mortality in Outpatient Maintenance Hemodialysis Patients with COVID-19

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**Background:** High mortality rates have been observed in patients with COVID-19 undergoing maintenance hemodialysis, potentially attributable to exacerbated inflammatory responses. Hemoperfusion, a therapeutic technique based on adsorption for removing inflammatory mediators, presents a promising therapeutic approach. However, its efficacy in improving outcomes for this patient population remains to be established.

**Methods:** This was a single-center retrospective cohort study conducted from December 7, 2022, to May 24, 2023, following the cancellation of the 'Dynamic Zero-COVID' policy during the Omicron variant surge. Patients with COVID-19 were stratified based on their hemoperfusion treatment status. We investigated all-cause mortality as the primary outcome, using adjusted Cox regression analysis. The risk of hospitalization, our secondary outcome, was examined through logistic regression models.

**Results:** Among the 224 patients who met the eligibility criteria, 118 (52.7%) underwent hemoperfusion treatment. The cohort's mean age was 62.8 ± 13.1 years, predominantly male (71.0%), with 89.3% lacking prior immunity to SARS-CoV-2. Over a 120-day follow-up, 25 patients succumbed, with mortality rates of 18.9% (20 patients) in the control group compared to 4.2% (5 patients) in the hemoperfusion group (p=0.001). Hemoperfusion was significantly associated with a reduced risk of all-cause mortality (HR, 0.234; 95% CI, 0.079 to 0.696; p=0.012) and hospitalization (OR, 0.423; 95% CI, 0.196 to 0.917; p=0.029), compared to controls. Additionally, the hemoperfusion group exhibited significantly lower mean changes in CRP, D-dimer, and serum ferritin levels than the control group within one month after COVID-19.

**Conclusions:** Hemoperfusion treatment in patients with COVID-19 on maintenance hemodialysis was linked to a decreased risk of all-cause mortality and a reduced in early inflammatory markers. These findings suggest that hemoperfusion may be a beneficial therapeutic strategy for COVID-19 management in the hemodialysis population, meriting further exploration.

## TH-PO247

### Evaluation of the Performance of the HA130 Hemoperfusion Cartridge in Patients Treated with Postdilution Hemodiafiltration (HDF): A Comparative Study with HDF Online Alone

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**Background:** Adsorption is a new frontier in extracorporeal purification for continuous and intermittent RRT. Evidence mainly comes from its use with bicarbonate dialysis. As OL-HDF is the new standard, we explored its benefits in HDF. This pilot study assesses the efficacy, safety, and tolerability of the HA130 cartridge with HDF-POST, compared to HDF alone.

**Methods:** Ten ESRD patients with AVF were treated with hemoperfusion using the HA-130 cartridge in series with POST-HDF with a TCA membrane (Solacea™ 1.7 and 1.9), reaching a 23 L x 1.73 $m^2$ exchange volume. A control group of ten similar patients received POST-HDF with the Solacea filter alone. Removal rates (RR) for various markers were evaluated and corrected for hemoconcentration. Session tolerability was assessed by monitoring intradialytic symptoms and circuit coagulation.

**Results:** For the HA130 + Solacea group, the exchanged infusion volumes were 22.9 ± 1L. The treatment was generally well tolerated without significant intradialytic symptoms or circuit coagulation. For the Solacea alone group, the exchanged infusion volumes were 23 ± 1L. The treatment was also well tolerated without significant intradialytic symptoms or circuit coagulation. The RR data for both groups are reported in Table 2 and Figure 1.

**Conclusions:** The combined HDF-POST + hemoperfusion treatment demonstrated superior depurative efficacy with high RRs for medium and high molecular weight molecules compared to the Solacea filter alone. The high tolerability and absence of significant complications during HDF-POST sessions highlight the potential of this technological combination in high-efficiency RRT settings.

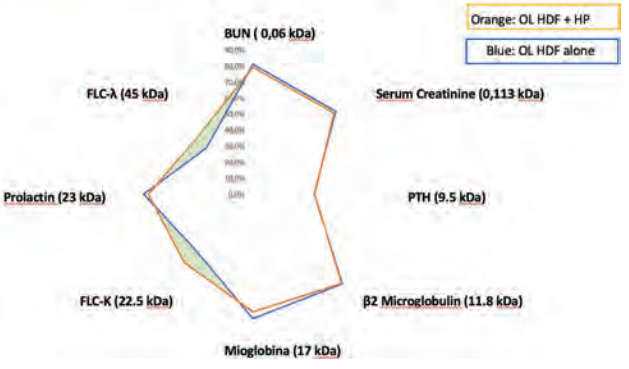
Table 1. Treatment characteristics

| Parameter | HA130 + Solacea | Solacea Alone | p-value |
|---|---|---|---|
| Qb [ml/min] | 345 | 350 | ns |
| Qd [ml/min] | 415 | 420 | ns |
| Duration [min] | 240 | 240 | ns |
| Weight loss [kg] | 2.4 | 2 | ns |
| Baseline Urea [mg/dL] | 72.1 | 69.5 | ns |
| Baseline Creatinine [mg/dL] (0.013 KD) | 9.41 | 8.47 | ns |
| Baseline PTH [pg/ml] (9.5 KD) | 365.15 | 332.67 | ns |
| Baseline β2-microglobulin [mg/L] | 28.91 | 27.85 | ns |
| Baseline Myoglobin [µg/L] | 174.5 | 127.5 | ns |
| Baseline FLC-κ [mg/L] (22.5 KD) | 162.1 | 177.5 | ns |
| Baseline Prolactin [ng/ml] (23 KD) | 14.95 | 28.16 | ns |
| Baseline FLC-λ [mg/L] (45 KD) | 103.82 | 127.93 | ns |
| Baseline Albumin [g/dL] (60 KD) | 3.81 | 3.53 | ns |

Table 2: RR Parameters

| RR Parameter | HA130 + Solacea (%) | Solacea Alone (%) | p-value |
|---|---|---|---|
| Urea [mg/dL] (0.06 KD) | 79 | 81 | 0.136 |
| Creatinine [mg/dL] (0.013 KD) | 72 | 73 | 0.405 |
| PTH [pg/ml] (9.5 KD) | 39 | 38 | 0.286 |
| β2-microglobulin [mg/L] (11.8 KD) | 79 | 79 | 1.000 |
| Myoglobin [µg/L] (17 KD) | 64 | 78 | 0.001* |
| FLC-κ [mg/L] (22.5 KD) | 60 | 50 | 0.016 |
| Prolactin [ng/ml] (23 KD) | 65 | 68 | 0.204 |
| FLC-λ [mg/L] (45 KD) | 50 | 41 | 0.008* |
| Albumin [g/dL] (60 KD) | 1 | 0 | 0.317 |

Figure 1: RR of Uremic Toxins




## TH-PO248

### Hemodialysis Coupled with Hemadsorption: Benefits on Uremic Toxins Retention and Oxidative Stress

Matteo Marcello,[1] Grazia Maria Virzì,[1] Vincenzo Cantaluppi,[2] Alessandra Brendolan,[1] Claudio Ronco.[1] *[1]Ospedale San Bortolo di Vicenza, Vicenza, Italy; [2]Universita degli Studi del Piemonte Orientale Amedeo Avogadro Scuola di Medicina, Novara, Italy.*

**Background:** Retention of middle-molecules and Protein Bound Uraemic Toxins (PBUT) in dialysis patients increases morbidity and mortality. Current dialysis techniques do not adequately clear these toxins. Furthermore, in dialysis patients, there's an increased inflammation and oxidative stress only partially attenuated by biocompatibility of newly developed membranes. This pathologic inflammatory response is associated to a particular form of programmed cellular death involving red blood cells, called Eryptosis. This study aimed to assess the safety of dialysis coupled with hemadsorption (HA+HD) in terms of biocompatibility and efficacy in terms of removal of middle-molecules and PBUTs.

**Methods:** This analysis of a multicentre observational study evaluated 4 dialysis sessions focusing on 7 chronic dialysis patients of our dialysis center. Patients were treated with HA+HD with HA130 cartridge (Jafron) in the early-week dialysis session and then returned to their usual prescription. Blood samples were taken before and after the dialysis session to measure Eryptosis as a marker of biocompatibility and a few uremic toxins to assess the efficacy of the treatment by using Removal Ratio.

**Results:** This study was carried out on 7 patients (4 women) with a mean age of 65.7 ± 11.5 years and a median dialysis vintage of 33 months (IQR 28-51). All patients had AVF with Qb of 330 ml/min. Dialysis lenght was 210 minutes. We didn't find any differences between Eryptosis values measured before and after dialysis (Table 1), and between different timepoints. We found significant reduction of PTH (pre: 391.5 ng/L, IQR 206.5-602.8 vs post: 162.0 ng/L, IQR 95.0-363.3; p=0.005) and β2-microglobulin (pre: 23.10 mg/L, IQR 22.1-24.1 vs post: 6.72 mg/L, IQR 6.2-8.3;p>0.005) throughout the HA+HD session.

**Conclusions:** We found that the addition of Hemadsorption allows a great removal of middle molecular-weight uremic toxins without compromising biocompatibility and thus represents a better treatment option in patients with high retention of these toxins.

Eryptosis values pre and post dialysis session

| | pre | post | p |
|---|---|---|---|
| session 1 | 0.40, IQR 0.3-0.55 | 0.25, IQR 0.2-0.38 | 0.31 |
| session 2 | 0.20, IQR 0.2-0.35 | 0.30, IQR 0.2-0.4 | 0.37 |
| session 3 | 0.20, IQR 0.2-0.45 | 0.40, IQR 0.25-0.55 | |
| session 4 | 0.30, IQR 0.15-2.9 | 0.20, IQR 0.15-0.35 | |

## TH-PO249

### Molecular Adsorbent Recirculating System (MARS) in Pediatric Patients

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**Background:** The Molecular Adsorbent Recirculating System (MARS®) uses an albumin enriched dialysis solution to remove protein-bound molecules that are not removed by conventional renal replacement therapy. Its use was approved in the United States for management of drug overdose and intoxication. Other proposed indications include acute liver failure and Data regarding the efficacy of MARS® in pediatric patients remain scarce.

**Methods:** Retrospective analysis of patients who received MARS® therapy at Cincinnati Children's Hospital Medical Center between January 1st, 2018 and November 30th, 2020. Collected data included age, sex, laboratory data, medical history, vascular catheter size, specifics of therapy, complications, and outcomes. Data existing in the electronic medical record were transcribed by investigators into a secure database.

**Results:** 17/25 patients demonstrated at least one sign of clinical improvement. 13/22 patients experienced improvement in encephalopathy. 6/20 patients demonstrated hepatic recovery. 6/18 patients experienced renal recovery. 4/21 patients underwent liver transplant. 16/25 patients survived until ICU discharge. Youngest patient to receive MARS® was 29 days old. Lowest weight was 2.1 kilograms.

**Conclusions:** We provide data on pediatric patients receiving MARS® at a high-volume tertiary care center. To our knowledge, this is the largest study on pediatric MARS® to date. We plan to expand this analysis to include data from 2014 – 2018 and 2020 – 2024.

| Demographics | Media(IQR) or N |
|---|---|
| Unique Patients | 23 |
| Courses of Treatment | 25 |
| # of Procedures | 83 |
| Age | 13.2 years (3.8, 17.9) |
| Weight | 41.7 kg (18.6, 60.3) |
| Sex | Males: 12<br>Females: 13 |
| Invasive Mechanical Ventilation at Initiation | Yes: 14<br>No: 10 |
| Multiorgan Dysfunction at Initiation | Yes: 21<br>No: 4 |
| CRRT at Initiation | Yes: 17<br>No: 8 |
| Anticoagulation | Citrate: 57<br>Heparin: 18<br>None: 8 |