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CLINICAL EXPERIENCE OF COMBINING SINGLE-USE HA130 HEMOADSORPTION CARTRIDGE WITH HIGH-FLUX HEMODIALYSIS IN MAINTENANCE HEMODIALYSIS PATIENTS

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Background: The main causes affecting the quality of life and leading to mortality in patients with end-stage chronic renal disease (ESRD) undergoing maintenance hemodialysis (HD) are long-term uremic complications. The use of hemoadsorption (HA) with the HA130 cartridge makes it possible to improve blood purification from standard uremic toxins and slow down the development or reduce the manifestations of these complications.

Methods: Five patients (4 women, 1 man; age 39-69 years, median 54.6) with 7-15 years of dialysis experience were studied. All received standard high-flux hemodialysis (HD) three times weekly (4 hours/session) using a Nikkiso DBB-05 machine with Medica Smartflux HFP dialyzers and HA130 hemoadsorption cartridges (Jafron Biomedical). Over 4 weeks, HA130 was used in a descending schedule: 3 sessions (Week 1), 2 (Week 2), and 1 each (Weeks 3-4). Standard heparinization and treatment regimens were maintained. iPTH and β2-MG levels were measured before and after sessions. Patient evaluations included interviews, medical history, physical exams (including BMI), and validated assessments: SF-36 (quality of life), PSQI (sleep quality) and VAS (pruritus intensity). Therapy tolerance and patient perceptions were systematically recorded.

Results: Post-procedure reductions averaged 62% for β2-MG (range 46-69%) and 30.5% for iPTH (range 12-47%), though levels rebounded to near-baseline before next session. After one month of combined therapy, pre-treatment iPTH and β2-MG levels showed an overall decreasing trend compared to baseline, except one patient's iPTH. HAHD demonstrated superior β2-MG clearance versus HD alone, though rebound syndrome occurred due to intercompartmental redistribution from tissue fluid. A graphical representation of the dynamics of iPTH and β2-MG for each patient is shown in Figure 1.

Pruritus improved in 3/5 patients (mean reduction: 54%), with no change in 1 case. Sleep quality enhanced in 4/5 patients (mean improvement: 36%). Arterial hypertension stabilized in 2 patients. Subjective reports noted better quality of life, including improved well-being, physical activity tolerance, pain reduction, mood, and decreased leg cramps/paresthesia. HAHD therapy was well-tolerated with no allergic reactions. Cartridge preparation and processing using the recommended dose of heparin did not require adjustments to the anticoagulant dosages routinely used for standard hemodialysis. Despite initial safety concerns, all patients opted to continue treatment after observing clinical benefits.

Conclusion: The HA130 cartridge emerges as a valuable adjunct to standard HFHD, offering biochemical and clinical benefits that address the unmet needs of long-term dialysis patients. By targeting middle molecules and protein-bound toxins, this approach may delay dialysis-related amyloidosis, mitigate cardiovascular risks, and enhance quality of life. Larger randomized controlled trials with extended follow-up are warranted to validate these findings and refine clinical implementation protocols.

Figure 1. Dynamics of changes in iPTH and β2MG for each patient.

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