

Cellulose membranes are more effective in holding back vital proteins and exhibit less interaction with plasma proteins during hemodialysis

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Abstract

The vast majority of patients with end-stage renal disease are treated with intermittent hemodialysis as a form of renal replacement therapy. To investigate the impact of hemodialysis membrane material on vital protein removal, dialysates from 26 well-characterized hemodialysis patients were collected 5 min after beginning, during 5 h of treatment, as well as 5 min before ending of the dialysis sessions. Dialysis sessions were performed using either modified cellulose (n=12) (low-flux and high flux) or synthetic Polyflux (n=14) (low-flux and high-flux) dialyzer. Protein removal during hemodialysis was quantified and the dialysate proteome patterns were analyzed by 2-DE, MS and Westernblot. There was a clear correlation between the type of membrane material and the amount of protein removed. Synthetic Poly flux membranes exhibit strong interaction with plasma proteins resulting in a significantly higher protein loss compared to modified cellulosic membrane. Moreover, the proteomics analysis showed that the removed proteins represented different molecular weight range and different functional groups: transport proteins, protease inhibitors, proteins with role in immune response and regulations, constructive proteins and as a part of HLA immune complex. The effect of this protein removal on hemodialysis treatment outcome should be investigated in further studies.

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Speaker Publications:

[1] Marwa Eltoweissy, Beneficial effects of histidine and carnosine on ethanol-induced chronic liver injury, Food and chemical toxicology 46 (2008) 1503-1509.

[2] Marwa Eltoweissy, Antioxidant characteristics of L-histidine, The Journal of Nutritional Biochemistry 9 (1998) 308-315.

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Biography:

Marwa Eltoweissy has completed her PhD through a scholarship and cooperation work between faculty of Science, Alexandria University, Egypt and Rheinische Friedrich-Wilhelms-University Medical Center Bonn, Institute for Physiology II, Germany. She completed her Post-doctoral studies in Gastroenterology and Endocrinology department, Georg-August University Medical Center, Göttingen, Germany. She completed Doctor of Natural Sciences in Nephrology and Rheumatology department, Georg-August University