



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.

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 Medical Center, Göttingen, Germany. She is a major scientific Researcher at the later department and an Assistant Professor of Physiology in Zoology department, Alexandria University, Egypt. She has published more than 30 papers in reputed journals and is serving as a Reviewer for privileged journals.