Osmotic deformability (Osmoscan) tests in Continuous Ambulatory Peritoneal dialysis (CAPD) patients at the end stage renal failure

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Aim: Peritoneal dialysis is a treatment method in advanced kidney failure. In this method, the abdomen is filled with a liquid called dialysis solution using a soft catheter. Anemia also is a primary problem due to deficiency of erythropoietin. In this study, we measured elongation index (EI) as a function of osmolality at a constant shear stress (SS) of 30 Pa to investigate the optimal osmolality range for the erythrocytes in patients under continuous peritoneal dialysis.

Method: The venous blood samples were collected from 15 patients and 13 healthy controls (mean age: 47.6±13.2 and 43.5±14.3 respectively). RBC deformability in osmotic gradient conditions was determined using osmotic gradient ektacytometry (Osmoscan). Minimal EI at low-osmotic environment (ELmin), maximal EI at the given SS (ELmax), half of the maximal EI at high-osmotic environment (ELhyper), osmolality at ELmin (Omin), osmolality at ELmax (Omax), osmolality at EI hyper (Ohyper) and the area under the individual EI, osmolality curves (Area) were measured.

Results: ELmin, ELmax, ELhyper, area and Ohyper values were found lower in patients with severe chronic kidney disease than controls (p<0.05), whereas Omin and Omax parameters were not significantly different.

Conclusion: Our findings point out that peritoneal dialysis results in the impairment of erythrocyte deformability under different osmotic gradient conditions. It should be considered as additional risk for their anemia throughout treatment.