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MYELOPEROXIDASE SERVES AS A MARKER OF OXIDATIVE STRESS DURING A SINGLE HEMODIALYSIS SESSION USING TWO DIFFERENT BIOCOMPATIBLE DIALYSIS MEMBRANES

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BACKGROUND. There is increased oxidative stress in patients undergoing hemodialysis (HD); however, little is known of how different dialysis membranes contribute to the oxidative stress induced by the dialysis procedure *per se*. We therefore studied the influence of two different dialysis membranes on oxidative stress during HD.

METHODS. Eight patients on HD three times per week were enrolled in this cross-controlled study. Patients sequentially received HD using polysulphone (PS) and regenerated cellulose (RC) dialysis membranes for 1 week each. Blood samples were collected in the last section of each hollow fibre 0, 15, 120 and 240 minutes after starting HD. We determined superoxide anion (O_2^-) production derived from neutrophils, superoxide dismutase (SOD) and glutathione peroxidase (GPx) derived from washed red cells, plasma myeloperoxidase (MPO), plasma thiobarbituric acid-reactive substances (TBARS), plasma advanced oxidation protein products (AOPP) and serum 8-hydroxy-2'-deoxyguanosine (8-OHdG).

RESULTS. Leukocyte numbers, including neutrophils, lymphocytes, and monocytes, dropped significantly after 15 minutes of dialysis, especially with the RC membrane. For both membranes, the levels of O_2^- production were transiently increased during the first 15 minutes and the post-dialysis levels were decreased. The differences in MPO were significant between the two membranes and persisted throughout the dialysis process. The levels of AOPP and 8-OHdG increased progressively when using RC membranes. There were no significant differences in SOD, GPx, TBARS, AOPP and 8-OHdG levels between the two membranes.

CONCLUSIONS. The biocompatibility of the dialyser affects oxidative stress production during a single dialysis session. The measurement of MPO may serve as a reliable marker of the degree of oxidative stress induced using dialysis membranes of different biocompatibilities.

Keyword: haemodialysis, Oxidative stress, biocompatibility