

## SUMMARY

Peritoneal dialysis (PD) is a form of renal replacement therapy using the peritoneum as a dialysis membrane. PD solutions employed to remove nitrogen metabolites and excess plasma fluid, and to restore electrolyte and acid-base balance are being developed to minimize local and systemic inflammatory responses while maintaining peritoneal homeostasis and host defense. The effect of chronic action of PD solutions on the peritoneum results in its remodeling and, possibly, eventual loss of peritoneal ultrafiltration capacity. Factors most responsible for late complications and peritoneal remodeling include high glucose levels in PD solutions, and the presence and formation of glucose degradation products (GDP) and advanced glycation end - products (AGEs) in the peritoneal cavity.

The aim of our study described in this dissertation was to test various PD solutions with different glucose content and GDP and, using AGEs receptor ligands, to define their systemic effects and identify PD solutions with highest biocompatibility. This part of the dissertation characterizes conventional glucose - based solutions, low - glucose and GDP load solutions as well as glucose polymer (icodextrin) - based PD solutions while determining the plasma and dialysate levels of soluble receptor for AGEs (s - RAGE) and its ligands, extracellular newly identified receptor for AGE (EN - RAGE) and high - mobility group box - 1 protein (HMGB - 1) in our search for any associations between the above ligands and systemic markers of inflammation on the one hand, and peritoneal characteristics on the other.

In part 1 of our study, patients receiving low - GDP load PD solutions were shown to have lower plasma levels of pro - inflammatory EN - RAGE and HMGB - 1 ligands, the implication being these solutions induce a smaller local inflammatory response and are associated with lower rates of AGEs production in the systemic circulation.

In another part of our study we investigated, using a dialysate cell population, the effect of icodextrin - based PD solution on mesothelial cell mass, and the relation of changes in the cell population to inflammatory markers (IL - 6) and a mesothelial mass marker (CA 125).

In this part of the study we demonstrated, using the icodextrin - based PD solution, a correlation between CA 125 and inflammatory markers that could be possibly explained by intraperitoneal inflammation enhancing CA 125 production by peritoneal mesothelial cells.

Based on our findings and given their strong correlation with inflammatory markers, EN - RAGE and HMGB - 1 could possibly serve as sensitive markers of biocompatibility and help guide future search for novel, more reliable mesothelial mass markers that would more closely reflect the biocompatibility of PD solutions.