Successful use of a new type of peritoneal dialysis fluid, makes procedure more tolerable

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The addition of a new type of fluid for use in peritoneal dialysis makes it easier to tolerate and protects the cells in the abdominal cavity. This could make the peritoneum more resilient to harmful effects, e.g. peritonitis. These are the findings of a recently published clinical study conducted by MedUni Vienna.

One of the main functions of the kidneys is to filter metabolic products out of the blood. If the kidneys are no longer able to do this, the blood has to be artificially purified and drained of excess fluid by means of dialysis. Around 10 percent of the current 5,000 or so dialysis patients in Austria use the flexible method of peritoneal dialysis (PD), in which the peritoneal membrane is used as a filter. Peritoneal dialysis allows them to the mobile and independent. However, after a while, the peritoneum can become "exhausted", if important endogenous protective mechanisms fail to act to protect against the dialysis fluids.

The study shows that adding a new type of peritoneal dialysis fluid with the active ingredient alanyl-glutamine (a dipeptide) boosts activation of heat-shock proteins, which are a key component in natural cell repair. If the correct amount of heat-shock proteins are produced, they are able to counteract the damage to the cells in the abdominal cavity caused by the dialysis fluid. The study also showed that the new PD fluid increases the reactivity of peritoneal immune cells. Once these important findings had indicated that this new fluid could reduce peritoneal damage in PD

patients, this parameter was further developed as a primary parameter in the currently ongoing clinical Phase-II trial.

The publication concerns a First-in-Man trial of this new type of peritoneal dialysis fluid. "The results provide initial indications of efficacy in Man and form the integral basis for a multi-centre Phase-II trial," explains lead author Klaus Kratochwill. "Plus, we now have preliminary data to indicate that it is safe for use in peritoneal dialysis in Man."

The study was conducted at MedUni Vienna as a joint project between the Division of Nephrology and Dialysis (Department of Medicine III, with Andreas Vychytil acting as lead investigator) and the Division of Paediatric Nephrology and Gastroenterology of the Department of Pediatrics and Adolescent Medicine (Christoph Aufricht – inventor of the new PD fluid). The active agent was developed by the Viennese company Zytoprotec, a spin-off from MedUni Vienna. Andreas Vychytil is also heading up the clinical Phase-II trial, which is already in progress.

Successful spin-off

The novel concept of cyto-protection comes from research conducted at MedUni Vienna's Department of Pediatrics and Adolescent Medicine and led to the foundation of the MedUni Vienna spin-off, Zytoprotec, in 2007. The new approach is based on the addition of substances to support the body's own cellular protection. Zytoprotec's interest in research into the mode of action of alanyl-glutamine and other potential cyto-protective substances, as well as the use of clinical samples from these studies to develop better biomarkers for peritoneal dialysis, formed the basis for a Christian Doppler Laboratory ("Molecular stress research in peritoneal dialysis", Head: Klaus Kratochwill), opened by MedUni Vienna in June 2016.

More information: Klaus Kratochwill et al. Addition of Alanyl-Glutamine to Dialysis Fluid Restores Peritoneal Cellular Stress Responses – A First-In-Man Trial, *PLOS ONE* (2016). DOI: 10.1371/journal.pone.0165045