Editorial

The Impact of Icodextrin on Mortality of Peritoneal Dialysis Patients

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Icodextrin is a water-soluble, high-molecular-weight glucose polymer that acts as a colloidal osmotic agent. It contains lactate rather than glucose, has a low pH value, and a low concentration of glucose degradation products (GDP). This solution is absorbed at a slower pace than glucose by the peritoneal cavity, primarily through the lymphatic vessels, thus maintaining the resulting colloidal osmotic pressure over a longer dwell time (8–16 hours).[1] Therefore, icodextrin is an important therapeutic option for optimizing fluid status, especially in patients with high transporter status. In addition, icodextrin also has beneficial effects on the metabolic profile[2,3], peritoneal membrane function[4], maintaining electrolyte balance, and improving nutritional status, which further contribute to improving the patient's quality of life.[5] In this edition of InaKidney, Budiman et al. found a prevalence of high transporters of 14.7%[6] , which is similar to that documented from the Australian and New Zealand Dialysis and Transplant (ANZDATA) registry of 16.7%.[7]

However, based on available evidence, the effect of icodextrin on patient survival remains unclear, likely due to small study sizes and limited follow-up durations. A meta-analysis of 10 RCTs involving 1,106 patients showed no significant difference in all-cause mortality and technical survival between icodextrin and PD solution.[8] Other studies have shown that icodextrin is associated with a lower risk of death and a first episode of peritonitis.[9] Although it significantly improves UF and reduces fluid overload with high certainty, icodextrin appears to reduce mortality modestly.[10] Based on analysis of data derived from the Peritoneal Dialysis Outcomes and Practice Patterns Study (PDOPPS), icodextrin failed to benefit patient survival (HR = 1.03; 95% CI, 0.72 to 1.48) or technical survival excluding death (HR = 1.20; 95% CI, 0.92 to 1.57).[11]

With its large sample size, the strength of the PDOPPS study is undeniable. However, it has several limitations. Icodextrin is generally used in patients with diabetes, higher transporter status, and hypoalbuminemia, which may indicate selection bias. Patients with these conditions have been associated with poorer outcomes.[12,13] Another limitation relates to the observational nature of the study itself, namely the difficulty in controlling and measuring salt and fluid intake, which also affect final volume status. Further, because of the large number of missing data (>50%), the potential influence of UF and peritoneal membrane function on clinical outcomes, if any, could not be examined, constituting an additional limitation of this study.

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Another factor associated with mortality outcomes that remains unclear is the duration of the study, which is generally less than 1 year. This is supported by retrospective cohort studies with a mean duration of more than 2 years, which have shown significant reductions in the risk of death and technique failure[14,15], suggesting the potential continuing benefits of icodextrin in real-world setting.

Finally, patient-centered outcomes associated with icodextrin use is important to evaluate. In high-risk patients, those with faster PSTR, a greater cardiovascular burden, and lower residual renal function, icodextrin is likely to improve clinical outcomes. Similarly, if icodextrin is initiated preventively in this subgroup of high-risk patients before volume overload occurs, it may improve clinical outcomes. However, it is important to understand that optimal volume management in PD patients must be multifaceted and cannot solely dependent on a specific PD solution. Further studies are therefore needed to evaluate patient-centered outcomes and to assess the cost-effectiveness of the preventive use of icodextrin.

Declarations

Competing interest

The author declares no conflict of interest.

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