



Abstract Type : Poster exhibition

Abstract Submission No.: A-0349

Abstract Topic : Non-dialysis CKD

Safety of Long-term Calcium Polystyrene Sulfonate Therapy in Hyperkalemic Patients with Chronic Kidney Disease: A Multicenter Real-World Retrospective Study

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Objectives : Hyperkalemia is a common and potentially life-threatening complication in patients with chronic kidney disease (CKD). Although calcium polystyrene sulfonate (CPS) has long been used as a potassium binder in Korea, real-world data regarding its long-term safety remain limited. This study evaluated the safety profile of CPS in hyperkalemic CKD patients and examined the impact of baseline CKD stage and serum potassium variability on clinical outcomes.

Methods : We conducted a multicenter retrospective observational study across three tertiary hospitals between October 2015 and September 2024. Adult CKD patients with at least one serum potassium ≥ 5.5 mmol/L who received CPS for ≥ 180 days were included ($n=3,094$). To minimize early exposure-related bias, safety outcomes were assessed from 90 days after CPS initiation up to 2 years and included arrhythmia, all-cause mortality, hospitalization due to hyperkalemia, emergency dialysis, and prescriptions for digestive disorder-related medications. Cox proportional hazards models were used to estimate hazard ratios (HRs), and pooled estimates were derived using random-effects meta-analysis.

Results : The mean age was 65.7 years, and 64% had CKD stage 4–5. During follow-up, hospitalization due to hyperkalemia occurred in 18.0%, emergency dialysis in 2.8%, arrhythmia in 2.4%, and all-cause mortality in 2.4%. Digestive disorder-related medications were prescribed in 62.7% of patients. Compared with CKD stage 1–2, stage 5 was independently associated with increased risk of hyperkalemia-related hospitalization (adjusted HR 2.12, 95% CI 1.36–3.29) and digestive medication use. Patients in the highest potassium variability quartile showed an increased risk of all-cause mortality (adjusted HR 2.03, 95% CI 1.05–3.95), whereas risks of hyperkalemia hospitalization and emergency dialysis did not significantly differ across variability groups.

Conclusions : In hyperkalemic CKD patients receiving long-term CPS, advanced CKD stage and high serum potassium variability were associated with worse clinical outcomes. Careful monitoring is warranted, particularly in stage 5 CKD and patients with marked potassium fluctuations during prolonged CPS treatment.



Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care

KSN SEOUL, KOREA
2026

The 46th Annual Meeting of the Korean Society of Nephrology



Jun 11 (Thu) – 14 (Sun), 2026

COEX, Seoul, Korea

Figure1.jpg

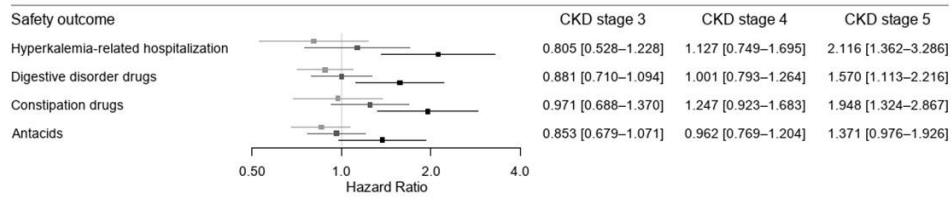


Figure1.jpg

