KSN 2019
Seoul, Korea · May 23 - 26

Abstract Type : Poster
Abstract Submission No. : PO-1025

Fracture risk in chronic kidney disease: a Korean population-based cohort study

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Objectives: Chronic kidney disease-mineral and bone disorder (CKD-MBD) and fracture risk are both closely related to declining renal function. Controlling hyperphosphatemia with phosphate binders is a basic principle of CKD-MBD treatment. The aim of this study was to identify differences in fracture risk between pre-dialysis CKD patients and end-stage renal disease (ESRD) on dialysis, and to evaluate the effects of phosphate binders on fracture risk in ESRD patients.

Methods: Data from a total of 89,533 CKD patients comprising CKD diagnosis, dialysis, fracture history, and phosphate binder prescription history were retrieved from the Health Insurance Review and Assessment Service Database from 2012 to 2016. Multivariate Cox regression analyses were performed to identify whether dialysis or phosphate binders were associated with an increased fracture risk.

Results: Overall, the rate of fractures in pre-dialysis CKD patients was 74 per 1000 patient-years, while that in dialysis patients was 84 per 1000 patient-years. The risk of fracture in ESRD patients was higher than pre-dialysis CKD patients (hazard ratio 1.16, 95% confidence interval 1.12–1.21, $P < 0.001$) after adjusting for confounding variables. In addition, the fracture risk in patients who were not taking phosphate binders was 20.0% higher compared to ESRD patient taking phosphate binders.

Conclusions: Fractures are more prevalent in ESRD patients on dialysis than pre-dialysis CKD patients. Use of phosphate binders is associated with a lower fracture risk in ESRD patients.