KSN 2020
FULLY VIRTUAL MEETING

Abstract Type : Poster
Abstract Submission No. : PO-1573

Risk of fracture according to glucocorticoid use in patients after renal biopsy

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Objectives: Few data are available regarding fracture risk in patients treated with glucocorticoids, including patients with kidney disease. The aim of the present study was to compare the incidence and fracture risk between biopsy proven-kidney disease patients with and without glucocorticoid treatment.

Methods: A population-based retrospective cohort study was performed using Health Insurance Review and Assessment Service database, a South Korean nationwide cohort set. This study identified 44,702 patients with diagnosis code of glomerular disease who received a renal biopsy between January 1, 2012 and December 31, 2017. A total of 8,624 patients met all study inclusion criteria. We investigated various levels of systemic glucocorticoid exposure by current daily dose, cumulative dose, cumulative exposure days, and peak dose. We also compared the incidence of overall fracture and specific fractures (hip, radius/ulna, pelvis, humerus, femur, and vertebral fractures) between the exposed group and unexposed group using Chi-square test. A time-dependent Cox regression model was used to assess the effect of covariates on the risk of fracture.

Results: A total of 1,406 fractures of any site were observed in the study period. The glucocorticoid-exposed group had more fractures than the unexposed group (14.4% vs 8.8%, $p \leq 0.001$). Fractures at vertebrae, upper limb, and lower limb were common. The exposed group showed a remarkably higher hazard ratio of fracture risk (HR: 6.0, 95% CI: 5.01-7.23) than the unexposed group, indicating systemic glucocorticoid exposure was highly associated with fracture risk. There was also a trend of increased fracture risk with increasing cumulative dose and age.

Conclusions: Fracture risk increased with increasing cumulative exposure and age. Vertebral fractures were the most common fractures. Risk increased at doses less than 5mg/day. Further research is warranted to understand the impact of glucocorticoid therapy in kidney disease.