KSN SEOUL, KOREA 2023
April 27(Thu) - 30(Sun), 2023
Coex, Seoul, Korea

Abstract Type : Oral
Abstract Submission No. : 1736

Time-varying risk factors for incident fractures in kidney transplant recipients: A nationwide cohort study from South Korea

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Objectives: Little is known about the time-varying risk factors for fractures in kidney transplant recipients (KTRs). This study investigated the incidence, location, and time-varying predictors of fracture following kidney transplantation (KT).

Methods: Data were obtained from the Korea Organ Transplantation Registry, a nationwide cohort study of KTRs. A total of 4,134 KTRs who received KT between January 2014 and June 2019 were included. Cumulative incidence and risk factors of fracture were evaluated using Kaplan-Meier method and Cox proportional hazard model.

Results: During a follow-up of 12,441.04 person-years (median 2.94 years), 63 patients developed incident fracture. The cumulative incidence of fracture was 2.10% at 5 years. The most frequent locations of fracture were leg (25.4%) and foot (22.2%). In multivariable analysis, older recipient age at baseline (hazard ratio [HR], 1.035; 95% confidence interval [CI], 1.007–1.064; $P = 0.013$) and higher tacrolimus trough level (HR, 1.112; 95% CI, 1.029 – 1.202; $P = 0.029$) were associated with higher risks for fractures. Diabetes mellitus had a time-dependent impact on fracture, with increasing risk as time elapses (HR for diabetes mellitus 1.115; 95% CI, 0.439-2.832; $P = 0.818$; HR for diabetes mellitus x *time*, 1.049; 95% CI, 1.007–1.094; $P = 0.022$).

Conclusions: KTRs had high risk of peripheral skeletal fractures in the first 5 years. Baseline recipient age, comorbid diabetes mellitus and tacrolimus trough level after KT were responsible for the fractures in KTRs.