**Abstract Type : Oral Presentation**
**Abstract Submission No. : F-007155**

# The effects of physical activity on fracture in kidney transplant recipients in South Korea : based on Korean National Health Insurance service data

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**Introduction:** Although kidney transplantation (KT) improves almost all functional aspects of the kidney, persistent renal osteodystrophy (ROD) leads to bone frailty and fractures due to long-standing administration of immunosuppressants and prevailing sedentary lifestyle. We investigated the relationship between health behavior, especially physical activity and fractures in kidney transplant recipients (KTR) using the database of Korean National Health Insurance Service (NHIS).

**Methods:** This retrospective study used the database of Korean National Health Insurance Service (NHIS). Of KT recipients who received health check-up from 2009 to 2016, 10,083 subjects were finally included. We investigated fracture incidence and predictive factors for fractures in health behaviors (smoking, drinking, physical activity, obesity) and comorbidities. Physical activity was categorized into three groups by metabolic equivalent task (MET) 500 (non-physical activity, MET 1-499 and MET500). Additionally, subgroup analysis was executed according to age and sex.

**Results:** Physical activity was protective for fractures in both categories of MET even after adjusting for all variables (MET 1-499: adjusted hazard ratio (aHR) 0.75, 95% confidence interval (CI) 0.62-0.92, MET500: aHR 0.84, 95% CI 0.70-1.0) and it was significant in individual fracture sites including vertebral and hip. In a subgroup analysis, although physical activity was not valid factor in the elderly, abdominal obesity was related to increase fracture risk in this group (aHR 1.42, 95% CI 1-2.02). Among established traditional risk factors for osteoporosis, female sex, age over 65 years, and diabetes mellitus (DM) also correlated with fractures in KTR.

**Conclusion:** As feasible and modifiable factors for fracture, physical activity is an effective strategy for prevention of fractures considering pleiotropic effects of exercise. Especially, resistance and endurance exercise should be executed for both decreasing abdominal obesity and preserving functional muscle mass.