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## **The Association of Bone Mineral Density and Incident Fracture Risk in Kidney Transplant Recipients: A single center experience**

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**Objectives:** Progressive bone loss is well known adverse effect in kidney transplantation (KT) recipients. We aimed to investigate the relationship between bone mineral density (BMD) and incident fracture after KT.

**Methods:** We included a total of 504 KT recipients at Ulsan University Hospital (UUH) from 1998 to 2019. The incident fracture was extracted from electronic medical record using Clinical Data Warehouse in UUH (uICE). The BMD was measured using dual-energy X-ray absorptiometry. Osteoporosis was defined as femur neck (FN)-T score  $\leq -2.5$ , and osteopenia was defined as  $-2.5 < \text{FN-T score} \leq -1.0$ .

**Results:** Incident fracture occurred in 43 patients during mean follow-up period of  $77.3 \pm 57.3$  months after KT. There was no significant difference in demographics except prevalence of diabetes between the fracture and control group (26.4% vs. 48.8%,  $p = 0.002$ ). A total of 270 patients examined BMD before KT, and 287 patients within 1 year after KT. Among them, 186 patients measured both pre- and post-transplant BMD. The proportion of osteoporosis, osteopenia, and normal in pre-transplant BMD was 10.4%, 44.4%, and 45.6%, respectively. The proportion of osteoporosis, osteopenia, and normal in post-transplant BMD was 17.4%, 44.9%, and 37.6%, respectively. The proportion of osteoporosis increased from 10.8% to 16.1% when comparing pre- and post-transplant BMD in patients with both pre- and post-transplant BMD results. On the Kaplan-Meier survival analysis, the fracture-free survival was not different among 3 pre-transplant BMD groups. The patients with osteoporosis according to post-transplant BMD showed significantly lower fracture-free survival than the other two groups ( $p = 0.005$ ). The BMD-decline group whose post-transplant FN-T score decreased than pre-transplant score did not exhibited difference in fracture-free survival compared to non-BMD-decline group.

**Conclusions:** The proportion of osteoporosis and osteopenia increased after KT. The BMD before transplantation did not predict fracture, but BMD within one year after transplantation predicted fracture.