

Abstract Type : Oral Presentation
Abstract Submission No. : F-005087

Pre-transplant coronary calcium score is an independent risk factor for long term mortality and cardiovascular event in kidney transplant patients

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Introduction: Cardiovascular disease (CVD) is the first cause of death in kidney transplant (KT) population. Both coronary calcium score (CCS) and abdominal aortic calcification (AAC) are well-known risk factor for CVD. Previous studies showed higher CCS was risk factor for CVD in KT population, however, most of these studies include small sample size. This study aimed to investigate the effect of pretransplant CCS and AAC on all-cause mortality and CVD event during long-term follow-up in a nationwide KT cohort.

Methods: The KoreaN cohort study for Outcome in patients With Kidney Transplantation (KNOW-KT) is a multicenter, observational cohort study. The data from 1,032 KT patients were used for this analysis. CCS was evaluated at baseline and 5-year follow-up; AAC was measured at baseline, 3-year, and 5-year follow-up. Epidemiologic parameters and laboratory data were collected every year. Clinical outcomes; all-cause mortality, cardiovascular event, and graft survival were assessed according to baseline CCS and AAC values.

Results: Median follow-up duration was 7.4 years. Both CCS and AAC were increased after KT, respectively; CCS (before KT, 209.1±680.2; 5-year after KT, 296.3±820.1) and AAC (before KT, 1.9±3.7; 3-year after KT; 2.1±3.6; 5-year after KT, 2.3±3.8). When we categorized subjects into tertile according to baseline CCS values (0, 0-100, >100) or baseline AAC values (0, 0-10, >10). In univariate analysis, all-cause mortality was highest in the 3rd tertile of CCS (P=0.001) and the 3rd tertile of AAC (P=0.003). The development of CVD was also highest in the 3rd tertile of CCS (P=0.001) and the 3rd tertile of AAC (P=0.001). Cox hazard proportion regression analysis showed that higher CCS was an independent risk factor for all-cause mortality (HR 6.705, 95% C.I.; 1.829-24.587, P=0.004) and CVD event (HR 4.882, 95% C.I.; 1.342-17.755, P=0.016).

Conclusion: Coronary arterial calcification before KT was an independent risk factor for long-term mortality and CVD morbidity after KT.