

Abstract Type : Oral

Abstract Submission No. : 1070

Association of serum activin level with progression of chronic kidney disease in patients with kidney transplantation: results from the KNOW-KT

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Objectives: Serum Activin A, TGF- β superfamily member, is a procachectic factor accumulating in chronic kidney disease (CKD). Activin A has been reported to contribute to vascular calcification and kidney fibrosis in CKD. We investigated whether higher serum activin level was associated with poor kidney outcomes in kidney transplant patients.

Methods: A total of 611 kidney transplant patients from KNOW-KT (KoreaN cohort study for Outcome in patients With Kidney Transplantation) were analyzed. We measured activin level at baseline and 1 year after kidney transplantation. The primary outcome was the composite of 50% decline in eGFR and kidney graft loss. The secondary outcome was coronary artery calcification score (CACS) at 5 years after kidney transplantation. Cox regression analysis was performed to analyze association of 1-year activin level with the primary outcome.

Results: The mean age was 45.3 ± 11.5 years and 223 (36.5%) patients were male. During 4,230.3 person-years of follow-up (median 6.9 years), the composite outcome occurred in 61 (10.0%) patients. Serum activin levels at 1 year were significantly lower than those at baseline (504.7 ± 264.8 vs 701.7 ± 355.3 , $P < 0.001$). When patients were grouped according to median activin level at 1 year, Cox regression analysis showed that risk of the composite kidney outcome was 2.26-fold (95% confidence interval [CI], 1.30-3.92, $P = 0.004$) higher in patients with higher activin level. In continuous modeling, 1 SD increase in serum activin level was associated with a 1.41-fold (95% confidence interval [CI], 1.14-1.75, $P = 0.001$) higher risk of composite kidney outcome. Binary logistic regression analysis demonstrated that activin level was significantly associated with CACS (Odds Ratio 1.7, 95% CI 1.1-2.6, $P = 0.014$). However, the activin levels did not increase risk of cardiovascular events.

Conclusions: Post-transplant activin level was independently associated with renal functional deterioration as well as coronary calcification in kidney transplant patients.