

Abstract Type : Poster
Presentation No. : POT 005

Serum bilirubin is a significant prognostic marker for renal progression and mortality in the patients with chronic kidney disease.

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Objectives: Mildly elevated bilirubin could protect kidney damage by reducing oxidative stress. However, it is still unclear that serum bilirubin level can predict clinical outcomes in the patients with chronic kidney disease (CKD). The aim of our study is to investigate the association of serum bilirubin and clinical outcomes in CKD patients.

Methods: A total of 5479 patients (mean age 58.0 years, 47.5 % male) who visited nephrology clinic at Seoul National University Boramae Medical Center in Korea between January 2006 and December 2016 were enrolled. These patients were divided 2 groups according to different baseline serum total bilirubin levels (≤ 1.0 , > 1.0 mg/dL). Primary outcome was end stage renal disease (ESRD) and secondary outcome was all-cause mortality. We conducted Cox analysis to evaluate the association between all-cause mortality and ESRD progression. Age, sex, eGFR, hypertension, and diabetes were included as covariates.

Results: Mean serum bilirubin level in this population at the time of baseline was 0.7 ± 0.5 mg/dL. A total of 738 patients (13.5%) had higher serum bilirubin level (> 1.0 mg/dL). Low bilirubin group was older and had more hypertension and diabetes. Also, eGFR of low bilirubin group was lower than that of high bilirubin group (71 ± 33 vs. 83 ± 27 mL/min/1.73m², $P < 0.001$). During the follow-up period of 79.4 ± 10.3 months, 409 (7.5%) patients developed ESRD and 688 (12.6%) patients were dead. In the multivariate cox analysis, higher serum bilirubin level significantly decreased the risk of ESRD ($P = 0.021$, hazard ratio [HR] 0.49, 95% confidence interval [C.I] 0.27-0.90). However, bilirubin level was not associated with all-cause mortality.

Conclusions: The lower serum total bilirubin level was significantly related with ESRD progression. Total serum bilirubin can be used as early biomarker for predicting ESRD development in CKD patients.