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Urinary transferrin/creatinine ratio as a biomarker for chronic allograft injury and rapid renal function decline in kidney transplant recipients

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Objectives : The aim of this study was to investigate the association of urinary transferrin with allograft function and renal function decline in kidney transplant recipients (KTRs).

Methods : Thirty KTRs whose eGFR were less than 60 mL/min/1.73m² (chronic allograft injury group) and 20 KTRs with normal allograft function group (control group) were included in this study. Though urinary proteomic analysis with LC-MS/MS, several urinary proteins including transferrin were identified and then validated by ELISA. Rapid renal function decline was defined as eGFR decline of >3 mL/min/1.73m²/year or initiation of dialysis, and 19 (38%) were included in rapid renal function decline group.

Results : Among protein profiles identified by proteomics, urinary transferrin levels were different between chronic allograft injury group and control group (63219 ± 42817 vs. 11192 ± 10535, P<0.001). Urinary transferrin/creatinine ratio measured by ELISA were also higher in chronic allograft injury group than control group (9.2 ± 8.0 vs. 4.0 ± 3.3, P=0.003), and had high association with chronic allograft injury group (AUC 0.753, 95% confidence interval [CI] 0.615-0.891, P<0.001) in ROC curve analysis. Additionally, urinary transferrin/creatinine ratio were higher in patients with rapid renal function decline than in those with stable renal function (11.6 ± 8.8 vs. 4.3 ± 3.6, P=0.002). Univariate logistic regression analysis revealed that urinary transferrin/creatinine ratio were significantly associated with rapid renal function decline (odds ratio [OR] 1.30, 95% CI 1.12-1.57; P=0.002). Multiple logistic regression showed urinary transferrin/creatinine ratio remained a significant risk factor for rapid renal function decline (OR 1.30, 95% CI 1.07-1.74; P=0.033). ROC curve analysis also revealed the AUC of 0.832 (95% CI 0.722-0.942, P<0.001) for urinary transferrin/creatinine ratio in predicting rapid renal function decline.

Conclusions : Urinary transferrin/creatinine ratio might be a potential biomarker for detection of chronic allograft injury and could be used as predictor for rapid renal function decline in KTRs.