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The Triglyceride and Glucose (TyG) Index as a Predictor of Adverse Cardiovascular Events in Hemodialysis Patients

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Objectives : The triglyceride and glucose (TyG) index have recently been established as an indicator of insulin resistance, which has the predictive values for cardiovascular (CV) disease. However, the clinical significance of the TyG index in hemodialysis (HD) patients remains unknown.

Methods : A total of 759 patients were enrolled in a prospective multicenter K-cohort from June 2016 to December 2023. The TyG index and echocardiographic parameters were examined at baseline. Circulating endostatin and VAP-1 were measured as vascular injury markers. The primary endpoint was defined as atherosclerotic CV events, cardiac events, and all-cause death.

Results : TyG index were positively correlated with circulating endostatin ($\rho = 0.134$, $P = 0.025$) and vascular adhesion protein-1 level ($\rho = 0.130$, $P = 0.012$). However, TyG index was not significantly correlated with left ventricular systolic and diastolic function, and left ventricular mass index. Patients in tertile 3 of the TyG index showed the highest cumulative event rate of CV events ($P < 0.001$) and cardiac events ($P = 0.001$). In multivariate Cox regression analysis, patients in tertile 3 of the TyG index were significantly associated with a 2.43-fold increased risk of CV events [95% confidence interval (CI) 1.32 – 4.47] and a 2.14-fold increased risk of cardiac events (95% CI 1.27 – 3.61) compared to patients in tertile 1 of the TyG index. However, patient mortality rate did not differ between the TyG index tertiles.

Conclusions : The TyG index was positively correlate with vascular injury markers, and significantly associated with increased risk of atherosclerotic CV events in HD patients. Our study suggests that the TyG index is useful to identify HD patients at high risk of atherosclerotic CV events.