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Association of the Trajectories of Metabolic Component and Outcomes in Patients with Chronic Kidney Disease

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Objectives: Patients with chronic kidney disease (CKD) were known to increase the risk of chronic diseases including hypertension (HTN), diabetes mellitus (DM), dyslipidemia while they also affect deterioration of renal function. However, little is known about the relation of changeable aspect for metabolic component to CKD progression.

Methods: We assigned patients to be clustered High and Low group followed by trajectory analysis using K-means clustering on basis of systolic, diastolic blood pressure (SBP,DBP), total cholesterol(TC), triglyceride(TG) and LDL cholesterol measurement at least two time point. The optimal number of clustering was selected by the Calinski-Harabasz index. Primary outcome was risk factor analysis by clustering group for eGFR decline, and death.

Results: The mean age of overall participants was 65.7±9.7 years, 50.4% for men and 11.8% for current smoker. The mean SBP was 127.8±15.8 mmHg, DBP was 83.6±8.4 mmHg. Total cholesterol, TG and LDL was 196.4±40.9, 147.1±89.8, 115.5±37.2 mg/dl, respectively. The mean SBP of cluster High group was 138.9±13.2, and Low group was 118.9±10.9mmHg. In TC clustering, High group was 223.4 ± 33.0, and Low group was 167.5 ± 26.6 mg/dl. The mean TG in High group was 266.1 ± 116.7, and Low group was 118.8 ± 46.1 mg/dl. In LDL clustering, cluster High group was 139.7 ± 31.2, and Low group was 89.9 ± 24.3 mg/dl. In multivariate logistic regression, SBP high group (OR 1.13 95%CI 1.066-1.212), TG high group (OR 1.15, 95% CI 1.069-1.240) were independently associated with eGFR decline. And, SBP high group (OR 1.82, 95%CI 1.070-3.123) and BMI lowest group (OR 2.19, 95%CI 1.07-4.38) were independently associated with death.

Conclusions: High SBP trajectory, and high TG trajectory have negative impacts on eGFR decline. And, High SBP trajectory, and low BMI trajectory affected overall survival. In CKD patients, more meticulous following up was needed for better clinical outcomes.