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Impact of the Longitudinal Changes of Left Ventricular Geometry on KT outcomes

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Objectives: Kidney transplantation (KT) improves the hemodynamic burden associated with volume overload, and anemia in patients with chronic kidney disease, but cardiovascular disease remains the leading cause of death after KT. This study evaluated the longitudinal change of metabolic and hemodynamic burdens and its impact on eccentric and concentric myocardial remodeling after KT.

Methods: A total of 600 patients who underwent echocardiography before and 3 years after KT were included from a multicenter observational cohort (KNOW-KT).

Results: After KT, values of triglycerides, and HbA1c increased, however, hemoglobin level and SBP were improved (all $P < 0.05$). Left ventricular ejection fraction (LV EF), LV mass index (LVMI), and LV end diastolic dimension (LVEDD) were significantly improved for 3 years, however, the myocardial concentricity represented by relative wall thickness (RWT) were increased from 0.39 ± 0.07 to 0.41 ± 0.07 .

In the correlation analysis between the change of echocardiographic and clinical parameters, the change of LVEDD was associated with change of hemodynamic stress such as hemoglobin or SBP, whereas the change of RWT showed significant association with change of metabolic stress such as HbA1c and triglycerides. A total of 30 major adverse cardiovascular events (MACE), such as myocardial infarction, angina, and stroke, were noticed after KT, and the incidence of MACE was significantly higher in patients with increased RWT than that in patients with increased LVEDD. Multivariate analysis, corrected for baseline parameters, revealed that an increase in RWT independently predicted the MACE occurrence, but other echocardiographic parameters including LVEF, LVMI, and LVEDD did not.

Conclusions: Longitudinal changes in myocardial concentricity are associated with the metabolic stress and have a significant impact on the new onset cardiovascular disease in KT patients. Improving metabolic burden after KT should be considered as an important strategy for amelioration of myocardial remodeling and adverse event.

Figure 1. Major cardiovascular events by changes in echo parameters.