

中文題目：過度的增加左心室質量會增加糖尿病腎病變患者心血管事件

英文題目：Excessive increase in left ventricular mass growth is independently associated with increased cardiovascular events in diabetic patients with chronic kidney disease

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**Background:** Predicted left ventricular mass (LVM) for sex, height<sup>2,7</sup>, and hemodynamic load can be used as an intraindividual reference to define the appropriateness of actual LVM. Inappropriate LVM is closely related to chronic kidney disease (CKD) and diabetes. However, there are limited studies to evaluate the association between observed/predicted LVM and cardiovascular events in diabetic patients with moderate to advanced CKD stages. This study is designed to assess the factors of observed/predicted LVM and whether observed/predicted LVM is independently associated with increased cardiovascular events in diabetic patients with CKD stages 3-5.

**Materials and Methods:** We consecutively enrolled 285 diabetic patients with CKD stages 3 to 5 from our Outpatient Department of Internal Medicine. Inappropriate LVM was defined as observed LVM more than 28% of the predicted value. Cardiovascular events were defined as cardiovascular death, hospitalization for unstable angina, nonfatal myocardial infarction, sustained ventricular arrhythmia, hospitalization for congestive heart failure, transient ischemia attack, and stroke. The relative cardiovascular events risk was analyzed by Cox-regression methods.

**Results:** There was a significant trend for a stepwise increase in predicted/observed LVM ( $P < 0.001$ ) and the prevalence of inappropriate LVM (63.0%, 73.4%, and 83.9%, respectively;  $P = 0.007$  for trend) corresponding to advance in CKD stages. Further forward multivariate analysis revealed a significant correlation between increases in observed/predicted LVM and advanced CKD stages ( $\beta = 0.107$ ,  $P = 0.016$ ), narrow pulse pressure, high body mass index, increased left atrial (LA) diameter, concentric left ventricular hypertrophy (LVH), eccentric LVH and left ventricular ejection fraction  $< 50\%$ . The follow-up period was  $24.8 \pm 12.7$  months, and sixty-four (22.5%) cardiovascular events were documented during the follow-up period. In the multivariate forward analysis, a history of coronary artery disease and atrial fibrillation, wide pulse pressure, decreased albumin, decreased hemoglobin, LA diameter  $> 4.7$  cm, and increased observed/predicted LVM (hazard ratio, 1.005; 95%

confidence interval, 1.001 to 1.009,  $P = 0.018$ ) were independently associated with increased cardiovascular events.

**Conclusions:** our study in diabetic patients of CKD stages 3-5 demonstrated a significant trend for a stepwise increase in observed/predicted LVM and the prevalence of inappropriate LVM. Increased observed/predicted LVM was closely associated with advanced CKD stages and adverse cardiovascular outcomes. The ratio of observed LVM to predicted LVM may help identify a high risk group of adverse cardiovascular outcomes in diabetic patients with CKD stages 3-5.

**Key words:** chronic kidney disease, diabetic nephropathy, observed/predicted left ventricular mass, inappropriate left ventricular mass, cardiovascular events