Association of major adverse cardiovascular events and all-cause mortality with left ventricular geometry in elderly

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Objective: To investigate the association of major adverse cardiovascular events and mortality with left ventricular geometry in elderly.

Methods: We prospectively recruited 3363 community-dwelling elderly (43.6% male, aged 71.1±5.9 years; 56.4% female, aged 71.1±6.1 years) from local community. Echocardiographic parameters were collected, left ventricular mass index (LVMi) above 115 g/m² in male or 95 g/m² in female, relative wall thickness (RWT) above 0.42 were considered as abnormal. Participants then were classified into 4 mutually exclusive groups as: normal geometry (normal LVMi and normal RWT), concentric remodeling (normal LVMi and increased RWT), eccentric hypertrophy (increased LVMi and normal RWT), concentric hypertrophy (increased LVMi and increased RWT). Cardiovascular death, non-fatal myocardial infarction including non-fatal ischemic stroke were recorded as incident MACE. Adjusted Cox regression models were used to evaluate the hazard ratios of MACE and all-cause mortality.

Results: Mean LVMi and RWT were 87.0±28.4 g/m² and 0.39±0.08. During a median follow-up of 5.4 years, we identified 224 incident MACE cases and 233 deaths. All-cause mortality was significantly greater in participants with eccentric hypertrophy (adjusted hazard ratio [HR]: 1.649; 95% confidence interval [CI]: 1.143-2.379) compared with normal geometry in multivariate analyses after adjusting for baseline covariates. Incident MACE was significant both in concentric hypertrophy (HR:1.982; 95% CI: 1.239-3.170) and eccentric hypertrophy (HR:1.846; 95% CI: 1.266-2.692) but not in concentric remodeling (HR:1.101; 95% CI: 0.759-1.597). Baseline LVMi was a significant predictor of all-cause mortality (HR:1.047 per 10g/m² increase in LVMi; 95% CI: 1.004-1.093). Similar results were observed with non-fatal myocardial infarction, non-fatal ischemic stroke and cardiovascular death.

Conclusion: Increased baseline LVMi and abnormal left ventricular geometry portend an increased risk for incident MACE and all-cause mortality in community dwelling elderly. From the pathophysiology point of view, per 10 g/m² increase in LVMi add 5% risk for all-cause mortality.
**Figures**

**Figure 1. Impact of LV Geometry on All-cause Mortality (A) and MACE (B)**

**Figure 2. Impact of LVMi on All-cause Mortality and MACE Stratified by Gender**

*Abbreviations: LVMi, left ventricular mass index; MACE, major adverse cardiovascular events; LVMi, left ventricular mass index (g/m²); LV, left ventricle.*