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Excessive increase in left ventricular mass identifies hypertensive subjects with clustered geometric and functional abnormalities.

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Abstract

BACKGROUND: Left ventricular mass (LVM) exceeding needs to sustain haemodynamic load has been termed 'inappropriate left ventricular mass'. We hypothesized that inappropriate LVM identifies hypertensive patients with clustered cardiac geometric and functional abnormalities.

METHODS: For this purpose, 359 hypertensive individuals without prevalent cardiovascular disease underwent Doppler echocardiography. Observed LVM exceeding more than 28% of the value predicted for individual cardiac work, body size and sex was defined as inappropriate LVM. Concentric left ventricular geometry was defined as age-adjusted relative wall thickness (RWT) greater than 0.40. Systolic dysfunction was defined as ejection fraction less than 50% or midwall shortening less than 14.7%. Diastolic dysfunction was defined as isovolumic relaxation time (IVRT) greater than 100 ms, E-velocity deceleration time greater than 220 ms or age and heart rate-normalized early/late (E/A) ratio less than 0.66. Left ventricular hypertrophy (LVH) was defined as an LVM index greater than 49.2 g/m^{2.7} in men and 46.7 g/m^{2.7} in women.

RESULTS: As expected, inappropriate LVM was associated with higher RWT, lower left ventricular systolic function, longer IVRT and prolonged E-deceleration time (all $P < 0.05$). Patients with inappropriate LVM had a higher prevalence of concentric geometry (65.5 versus 40.4%), systolic dysfunction (67.9 versus 47.4%) and diastolic dysfunction (46.4 versus 39%; all $P < 0.001$) than those with LVH. Inappropriate LVM had greater sensitivity (0.89 versus 0.54) and specificity (0.82 versus 0.62; both $P < 0.01$) than LVH in identifying patients with clustered left ventricular concentric geometry, systolic and diastolic dysfunction.

CONCLUSIONS: Inappropriate LVM is associated with a cluster of concentric left ventricular geometry, delayed left ventricular relaxation and reduced systolic performance. Compared with LVH, inappropriate LVM is more accurate at identifying patients with clustered left ventricular geometric and functional abnormalities.

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