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The Correlation between Aortic Stiffness and Left Ventricular Mass Index in Hypertensive Patients: A Cardiac MRI Study

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Abstract

Background and Objective: In hypertensive patients, increased left ventricular (LV) mass and impaired aortic stiffness are independent predictors for cardiovascular events. There were some prior studies whichestablished the correlation between left ventricular hypertrophy and aortic stiffness; nevertheless, there are limited data in hypertensive patients. Furthermore, few studies applied cardiac MRI which is a promising technique for LV mass assessment. The authors sought to assess the correlation of LV mass and impaired aortic stiffness, as measured by cardiac MRI.
Material and Method: A total of 113 hypertensive patients (mean age 68.9 + 10.3 years, female 51.3%) who underwent cardiac MRI study were enrolled. Left ventricular mass was obtained by summation of multiple slice technique and then calculated into the left ventricular mass index. Aortic stiffness was measured as aortic pulse wave velocity (PWV) by distance divided by time delay between mid-ascending and mid-descending aorta. Pearson correlation analysis was applied to determine the correlation of aortic stiffness and left ventricular mass index.
Results: Mean left ventricular mass index was 53.39 + 18.32 g/m2, mean PWV was 11.72 + 5.11 m/s. No correlation was found between PWV and LV mass index (r = 0.085, p-value = 0.37). However, aortic stiffness had significant correlation with age (r = 0.469, p-value < 0.001).
Conclusion: There was no significant correlation between LV mass index and aortic stiffness in hypertensive patients. This may be explained by the relatively less severe left ventricular hypertrophy in our patients.

Keywords: Aortic stiffness, Pulse wave velocity, Left ventricular mass, Hypertension, Magnetic resonance imaging

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