PET/CT assessment of symptomatic individuals with obstructive and nonobstructive hypertrophic cardiomyopathy.

Abstract:
Patients with obstructive hypertrophic cardiomyopathy (HCM) exhibit elevated left ventricular outflow tract gradients (LVOTGs) and appear to have a worse prognosis than those with nonobstructive HCM. The aim of this study was to evaluate whether patients with obstruction, compared with nonobstructive HCM, demonstrate significant differences in PET parameters of microvascular function. PET was performed in 33 symptomatic HCM patients at rest and during dipyridamole stress (peak) for the assessment of regional myocardial perfusion (rMP), left ventricular ejection fraction (LVEF), myocardial blood flow (MBF), and myocardial flow reserve (MFR). Myocardial wall thickness and LVOTG were measured with an echocardiogram. Patients were divided into the following 3 groups: nonobstructive (LVOTG=30 mm Hg at rest and with provocation), and latent HCM (LVOTG=30 mm Hg with provocation). Eleven patients were classified as nonobstructive (group 1), 12 as obstructive (group 2), and 10 as latent HCM (group 3). Except for age (42 ± 18 y for group 1, 58 ± 7 y for group 2, and 58 ± 12 y for group 3; P = 0.01), all 3 groups had similar baseline characteristics, including maximal wall thickness (2.3 ± 0.5 cm for group 1, 2.2 ± 0.4 cm for group 2, and 2.1 ± 0.7 cm for group 3; P = 0.7). During peak flow, most patients in groups 1 and 2, but fewer in group 3,
exhibited rMP defects (73% for group 1, 100% for group 2, and 40% for group 3; P = 0.007) and a drop in LVEF (73% for group 1, 92% for group 2, and 50% for group 3; P = 0.09). Peak MBF (1.58 ± 0.49 mL/min/g for group 1, 1.72 ± 0.46 mL/min/g for group 2, and 1.97 ± 0.32 mL/min/g for group 3; P = 0.14) and MFR (1.62 ± 0.57 for group 1, 1.90 ± 0.31 for group 2, and 2.27 ± 0.51 for group 3; P = 0.01) were lower in the nonobstructive and higher in the latent HCM group. LVOTGs demonstrated no significant correlation with any flow dynamics. In a multivariate regression analysis, maximal wall thickness was the only significant predictor for reduced peak MBF (\(\beta = -0.45, P = 0.003\)) and MFR (\(\beta = -0.63, P = 0.0001\)). Maximal wall thickness was identified as the strongest predictor of impaired dipyridamole-induced hyperemia and flow reserve in our study, whereas outflow tract obstruction was not an independent determinant.

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