ORIGINAL ARTICLE

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Relation between myocardial response to dobutamine stress and sympathetic nerve activation in patients with idiopathic dilated cardiomyopathy: A comparison of ^{123}I-MIBG scintigraphic and echocardiographic data

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It is likely that a close association exists between findings obtained by two methods: dobutamine stress echocardiography and ^{123}I-MIBG scintigraphy. Both of these methods are associated with β-adrenergic receptor mechanisms. This study was conducted to demonstrate the relation between myocardial response to dobutamine stress and sympathetic nerve release of norepinephrine in the failing heart. In 12 patients with heart failure due to idiopathic dilated cardiomyopathy, the myocardial effects of dobutamine stress were evaluated by low-dose dobutamine stress echocardiography; and sympathetic nerve function was evaluated by scintigraphic imaging with iodine-123 [^{123}I] meta-iodobenzylguanidine (MIBG), an analogue of norepinephrine. Echocardiography provided quantitative assessment of wall motion and left ventricular dilation; radiotracer studies with ^{123}I-MIBG provided quantitative assessment of the heart-to-mediastinum (H/M) uptake ratio and washout rate. Results showed that H/M correlated with baseline wall motion ($r = 0.682$, $p = 0.0146$), wall motion after dobutamine stress ($r = 0.758$, $p = 0.0043$), the change in wall motion ($r = 0.667$, $p = 0.0178$), and with left ventricular diastolic diameter ($r = 0.837$, $p = 0.0007$). In addition, the ^{123}I-MIBG washout rate correlated with baseline wall motion ($r = 0.608$, $p = 0.0360$), wall motion after dobutamine stress ($r = 0.703$, $p = 0.0107$), and with the change in wall motion ($r = 0.664$, $p = 0.0185$). Wall motion, especially in the myocardial response to dobutamine stress, is related to sympathetic nerve activity in heart failure.

Key words: ^{123}I-MIBG scintigraphy, dobutamine stress echocardiography, idiopathic dilated cardiomyopathy