

Study: Emotional Stress & Cardiac Dysfunction

Study Explores Link Between Emotional Stress and Cardiac Dysfunction

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During the past decade, cases of symptomatic heart failure have been reported in patients who have experienced recent episodes of acute emotional stress. So far, however, the mechanisms involved have remained unknown.

To investigate the phenomenon, a team of researchers evaluated 19 patients, aged 52 to 71, who had been admitted to a coronary care unit with left ventricular dysfunction after an emotionally stressful event, most often the death of a loved one. Eighteen of the 19 patients were women.

All patients underwent coronary angiography and serial echocardiography. Additional tests, such as endomyocardial biopsy, were performed on some or all of the patients. Results were compared to those from patients with Killip class III myocardial infarction.

Key results included:

All patients with stress cardiomyopathy had severe left ventricular dysfunction on admission, but this condition rapidly resolved after several weeks.

All patients with stress cardiomyopathy had markedly elevated levels of plasma catecholamines and stress-related neuropeptides, compared to the patients with myocardial infarction. These high levels persisted even a week after onset of symptoms.

The data suggest that exaggerated sympathetic stimulation of the adrenomedullary hormonal system, mediated by catecholamines and stress-related neuropeptides, may be at the root of stress cardiomyopathy, the researchers speculated.

Although the exact mechanism leading to cardiac damage is still unknown, the researchers suggested that the sympathetic stimulation of the adrenomedullary hormonal system could lead to ischemia resulting from coronary arterial spasm, abnormal coronary blood flow resulting from microvascular spasm, or direct myocyte injury caused by elevated catecholamine levels.

Although the striking preponderance of women subjects in the study suggests a biologic susceptibility to stress cardiomyopathy, the researchers noted that the basis of this apparent predisposition remains unknown.

In the four years during which the researchers followed patients with stress cardiomyopathy, no patient has died, no patient has experienced a recurrence, and no patient has experienced a decline in left ventricular function.

Furthermore, the researchers pointed out, when medical support is provided promptly, patients with stress cardiomyopathy have experienced rapid improvement and have an excellent prognosis.

Action Points

Be aware that extreme emotional stress can precipitate severe, reversible left ventricular dysfunction in patients without coronary artery disease.

Understand that stress cardiomyopathy has an excellent prognosis when medical support is promptly provided.

Primary source: *The New England Journal of Medicine*

Source reference:

Wittstein I, et al. Neurohumoral Features of Myocardial Stunning Due to Sudden Emotional Stress. *NEJM*. 2005;352:539-48