Syncope caused by cardiac asystole during dobutamine stress echocardiography

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Abstract
Syncope caused by cardiac asystole during dobutamine stress echocardiography occurred in a 60 year old woman presenting with chest pain and a non-diagnostic exercise test. Cardiac asystole was not associated with myocardial ischaemia and was attributed to a powerful cardioinhibitory vagal reflex elicited by the stimulation by the drug of cardiac and aortic mechanoreceptors. Cardiac asystole was promptly reversed by the administration of atropine with no significant sequelae.

Case report
A 60 year old woman was admitted for evaluation of chest pain occurring both at rest and on effort. A basal electrocardiogram showed normal sinus rhythm and slight T wave abnormalities. Physical examination and chest x ray were normal. A cross sectional echocardiogram showed normal left ventricular wall thickness, normal segmental wall motion, and systolic function. A supine bicycle exercise stress test was interrupted after four minutes of exercise because of dyspnoea and fatigue at an heart rate of 100 beats/min (62% of the age-predicted maximum heart rate) with no significant ST-T changes. A dobutamine stress echocardiographic test was then performed according to a previously described protocol. At baseline her heart rate was 63 beats/min and her blood pressure was 180/100 mm Hg. At a dobutamine dose of 20 μg/kg for two minutes the heart rate now, cardiac asystole has not been described during dobutamine stress echocardiography in more than 1700 tests.

Keywords: dobutamine stress echocardiography; asystole; syncope

Ventricular arrhythmias are the most common side effect of dobutamine stress echocardiography. They are related to the adrenergic activity of dobutamine. A syndrome characterised by dizziness, bradycardia, and hypotension has occasionally been described. It is thought to be mediated by a vagal activation caused by the stimulation of mechanoreceptors of the myocardial wall and of the aortic root. Usually it is not associated with myocardial ischaemia. When it causes severe symptoms the test may have to be stopped. Until
increased to 82 beats/min and blood pressure to 195/90 mm Hg. Diffuse left ventricular hyperkinesia with increased systolic thickening of all myocardial segments was apparent. During the third minute of this step heart rate decreased to 60 beats/min; then cardiac asystole caused by sinus arrest suddenly developed and lasted more than eight seconds (figure) causing abrupt loss of consciousness. External cardiac massage was started immediately and an intravenous bolus of atropine (1 mg) was given. Sinus rhythm was rapidly restored and she regained consciousness with no neurological sequelae. Sinus tachycardia (145 beats/min) followed the administration of atropine with no electrocardiographic or echocardiographic signs of ischaemia. The patient refused coronary arteriography and electrophysiological evaluation of sinus function.

Discussion
The syndrome characterised by hypotension, bradycardia, and dizziness occurring during dobutamine administration has been thought to be due to vagal activation caused by the stimulation of mechanical receptors in the aorta or myocardium by the vigorous myocardial contraction induced by the drug. This side effect was detected in some patients performing dobutamine stress echocardiography, ranging from 14% in the study of Mazeika et al.1 to 0-3% in the study of Mertes et al.1 In a few cases only it was associated with myocardial ischaemia or impaired left ventricular systolic function.1 To the best of our knowledge, however, there are no earlier reports of syncope in patients undergoing dobutamine stress echocardiography. Although we cannot be certain that there were no important coro-