Hypotension and Dobutamine Stress Echocardiography

To the Editor:

The report by Mertes and colleagues describes the safety of dobutamine stress echocardiography (DSE) in the detection of myocardial ischemia. Surprisingly, they observed a decline of systolic blood pressure in only 36 patients (3.2%).

These data are in contrast with those of previous reports on smaller populations[1-5] that showed a 10% to 14% occurrence of hypotension during DSE.

To date, the implications of this side effect have not been elucidated. Hypotension may be related to dynamic left ventricular (LV) obstruction[6] or to cardiovascular reflexes induced by the β1- (and not β2-) stimulating properties of dobutamine. Moreover, hypotension and/or bradycardia may be caused by a vasovagal reflex.[7]

In our series of 109 patients undergoing DSE after withdrawal of all medications, mild hypotension occurred in 11 patients (10%): of these, 3 had a depressed ejection fraction (38%, 40%, and 48%). However, hypotension during DSE does not appear to be a marker for coronary artery disease, regional asynergy, or LV dysfunction.

Again, we recently observed (A. Capezzuto, A. Achilli, unpublished observations) a case of severe bradycardia and hypotension at the end of DSE in the absence of LV dynamic obstruction or regional dysnergy. The patient had a normal ejection fraction. A further insight of the study of Mertes is that almost 50% of the patients were receiving β-blockers. The medications, which were not withheld during the test, could mask hypotension by relieving LV dynamic obstruction or β1-mediated reflexes. Moreover, two aspects of the study protocol may variously influence the occurrence of hypotension. First, the peak dose of dobutamine was higher than usual, with a theoretically greater incidence of hypotension. Second, the atropine added to DSE could indeed prevent the development of a vasovagal reflex. The EDIC study group,[8] with a similar protocol, showed a very low prevalence of hypotension and/or bradycardia (1%).

In conclusion, the pathophysiology and significance of hypotension during DSE are still under debate. We are of the opinion that atropine could indeed prevent hypotension but probably might increase the risk of arrhythmias, whereas β-blocker therapy before DSE predicts the best outcome in terms of this side effect.

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References


Reply

We appreciated the comments of Dr. Pontillo and colleagues regarding the occurrence and pathophysiology of dobutamine-induced hypotension reported in our study of the symptoms, adverse effects, and complications of dobutamine stress echocardiography. However, it shold be noted that the 3.2% of patients who were reported as having hypotension in that investigation represents only those patients in whom the dobutamine infusion was discontinued because of hypotension. This proportion of patients represents only a fraction of subjects who experience some decline in systolic blood pressure during dobutamine infusion. In our laboratory, physicians monitoring the stress test do not routinely discontinue the dobutamine infusion with modest declines in systolic blood pressure in the absence of symptoms of hypotension or objective evidence of myocardial ischemia.

Previous investigators have reported that as many as one third of patients may manifest a decline in systolic blood pressure during dobutamine infusion. We have also observed that modest declines in systolic blood pressure from one stage of dobutamine infusion to another is common. However, the frequency of profound decreases in systolic blood pressure below baseline values appears to be less common. A recent investigation from our own laboratory demonstrated that 10% of patients (197 of 1886) had hypotension defined as a fall in systolic blood pressure equal to or more than 15% of the baseline value. In addition, we did not find an association of hypotension with either β-blocker therapy or the use of atropine. Forty-one percent of subjects with hypotension and 36% of patients without hypotension received atropine. Sixteen percent of patients with hypotension and 19% of subjects...
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