Safety and Feasibility of a Single-Staged Accelerated Dobutamine Stress Echocardiography Protocol

T.S. Brandon Ng[1]; Waleed M. Ali[2]; Christina L. Luong[3]; Michael Y.C. Tsang[3]; Darwin F. Yeung[3]; John Jue[3]; Parvathy Nair[3]; Ken Gin[3]; Teresa S.M. Tsang[3]

Affiliations:
[1]Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada
[2]Central Manchester University Hospitals NHS Foundation Trust, Manchester, UK
[3]Division of Cardiology, Department of Medicine, University of British Columbia, Vancouver, British Columbia, Canada

Background:
Accelerated dobutamine stress echocardiography protocols have been reported as potential alternatives to the standard protocol in reducing study duration. The aim of this study was to evaluate the safety of an accelerated single-staged dobutamine stress echocardiography (DSE) protocol.

Methods:
This retrospective study assessed patients who underwent clinically indicated accelerated DSE protocol between January 2007 and September 2022. The accelerated DSE protocol consisted of a continuous dobutamine infusion at 50 μg/kg/min for up to 10 minutes with adjunctive atropine (0.2mg – 2.0mg) administered if the target heart rate has not been achieved. Data on patient demographics, atropine use, study outcomes, patient-reported symptoms, arrhythmias, and other complications were reviewed.

Results:
A total of 670 patients were identified with a mean age of 65 years (325 men, 49%). Of these patients, 65% had hypertension, 57% had dyslipidemia, and 31% had a history of coronary artery disease. Statins (53%), ACEI/ARB (48%), and ASA (48%) were the most commonly reported home medications. The majority of the patients (88%) achieved the target heart rate, with 34% of patients requiring atropine (mean dose of 0.56 mg) to achieve target heart rate. There were 8 (1%) patients who did not reach target heart rate but had positive stress echocardiography findings. Test results and complications are listed in the table below (Table 1). There were no cases of heart failure, acute myocardial infarction, sustained ventricular arrhythmia, or death.

Conclusion:
The accelerated single-staged dobutamine stress echocardiography protocol presented in this work appeared safe and well tolerated.

Table 1: Study results and complications	
Test results	
ECG positive	82 (12%)
ECG negative	462 (69%)
ECG non-diagnostic	126 (19%)
Stress echo positive	61 (9%)
Stress echo negative	536 (80%)
Stress echo non-diagnostic	73 (11%)
Hemodynamic responses	
Hypertensive (peak SBP >220 mmHg or DBP >120 mmHg)	12 (2%)
Hypotensive (SBP <90mmHg)	5 (1%)
Hypotensive (SBP >30 mmHg drop)	43 (6%)
Arrhythmias	
PVCs	126 (19%)
PACs	69 (10%)
SVT	15 (2%)
Atrial fibrillation/flutter	9 (1%)
Nonsustained VT	7 (1%)
High grade AV block	1 (0.2%)
Premature test termination	
Intolerable symptoms	18 (3%)
Arrhythmia	3 (0.4%)
Hemodynamic responses	6 (1%)
LVOT obstruction	2 (0.3%)
Beta-blocker reversal	
Suppress arrhythmia	4 (0.6%)
Intolerable symptoms	5 (0.7%)
Hemodynamic responses	1 (0.2%)
*Results reported as frequencies [n (%)]	