Safety of dobutamine stress contrast echocardiography; a single-center experience of 15 years

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Introduction: Dobutamine stress contrast echo (DSCE) is an accurate method for the diagnosis of coronary artery disease (CAD). Scarcity of serious adverse events has led to its establishment as a popular method for the diagnosis of CAD and to its increased use beyond CAD. However, data regarding the safety of single-line dobutamine and contrast infusion are limited. The aim of our study was to assess the safety of a DSCE protocol using a single line of intravenous access.

Methods: Over a 15-year period (2004-2018), 34,675 patients underwent DSCE in our department, which was performed using 10-20-30-40-50 µg/kg/h of dobutamine with dosage increase every three minutes, while atropine up to 1mg could also be administered. Two commercially available contrast agents were used at rest and at peak in all patients and a single intravenous line was used for infusion of dobutamine, atropine and contrast agents. Demographic data, risk factors and information concerning the most common cardiovascular or allergic adverse events were available for all patients. Finally, the adverse events of DSCE were compared with respective events reported by relevant studies in order to determine the safety of our method.

Results: Mean age of patient population was 63.9 (SD: 11.4 years), while 67.9% of patients (n=23,544) were males. There were 22,731 hypertensive patients (65.6%), 9,256 diabetics (26.7%), 21,683 patients (62.5%) had dyslipidemia, 11,760 (33.9%) were smokers and 10,437 (30.1%) had a positive family history of CAD. Adverse events were reported in 876 patients (2.5%). Allergic reaction was reported in 69 patients (0.2%). We recorded 643 patients (1.85%) with non-sustained VT or frequent premature ventricular ectopic beats and 154 patients (0.44%) with AF or SVT episodes leading to protocol termination. In 24 patients (0.07%) with sustained VT, antiarrhythmic drugs were given intravascularly, while in 10 patients (0.03%) with VT or VF, resuscitation was needed. No death was reported. Frequency of life threatening adverse events reported by relevant studies did not differ significantly when compared to the present results.

Conclusion: DSCE protocols involving single line infusion of dobutamine, atropine and ultrasound enhancing agents are safe, since adverse event rates are low and do not differ significantly to rates reported for unenhanced DSE by other relevant studies. Implementation of such protocols in clinical practice may increase patient comfort and cost-effectiveness and should therefore be encouraged.