



## Pharmacological Stress Echocardiography with Low Dose Dobutamine Associated to Isometric Exercise and Early Atropine – Report of an Experience with the New Protocol\*

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In the Pharmacological Stress Echocardiography with Low Dose Dobutamine Associated to Isometric Exercise and Early Atropine study published in this issue of the Magazine, being aware of the good safety profile of the kind of stress used and of the potential complications of the method, the authors addressed a new protocol, which is different due to the administration of low dose dobutamine early associated to continuous isometric exercise and atropine. This means the isometric exercise is initiated together with the 10 mcg/kg/min dose of dobutamine, constantly, and, subsequently, 0.25 mg of atropine is initiated every minute up to a maximum of 2 mg, also in an early stage.

Certainly, new protocols that are able to optimize exam duration, reduce complications and side effects, and maintain or increase the accuracy of the method are very much welcomed. However, the study design could not address these issues. We did not get any information on reduction of exam duration and number of complications, although the comparison of this new protocol to those already established in the literature or sensibility and specificity data had raised such expectation.

Nevertheless, it was possible to note the inclusion of the 15 mcg/kg/min dose to this protocol, which could increase exam duration. The isometric exercise was conducted with a rubber ball, and not with a standard hand grip. The transmitral flow changing parameter to assess the suitability of the isometric exercise was not used, which could result in the technique being sub efficient.

According to McNeill et al.<sup>1</sup>, the addition of atropine is responsible for increasing the sensibility of dobutamine stress echo. For this reason, its use is well indicated in patients with chronotropic incompetence<sup>2</sup>. Atropine is also able to reduce the number of inconclusive tests through the chronic use of beta-blocker<sup>3</sup>.

It is also possible to note that out of the 156 patients in the study, 12 had a hyper-reactive response in blood pressure, leading to test interruption. This may occur when the chronotropism stimulus is presented too early, in the first or second stage of the dobutamine echocardiogram. This may lead to test interruption, increasing the number of inconclusive tests. Additionally, the exercise applied in an early stage and continuously potentially leads to muscle fatigue, which results in the loss of protocol standardization and reproducibility.

Another important point about the study is the administration of metoprolol 5 mg in the peak of the stress in order to increase method sensibility, especially for univascular cases. However, in a new protocol it might be better to use venous metoprolol at the end of the test only to revert dobutamine adverse effects after it has been discontinued, so that there are no additional variables that may interfere in the results and accuracy of the new protocol.

As the study proposal is quite interesting, for the purposes of standardizing and reproducing this protocol, it is important to mention some considerations in the form of suggestions: maintain the already defined

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stages of echocardiogram with dobutamine (5, 10, 20, 30 and 40 mcg/kg/min); add standard hand grip and early atropine, preferably in the third stage of the test; monitor the effectiveness of the isometric exercise, as well as the possibility of the exercise being continuous, with no interruptions due to muscle fatigue; use endovenous metoprolol after the end of the protocol to revert dobutamine adverse effects only<sup>4</sup>.

After these suggestions are put into practice, a new study with accuracy data will probably support the new method.

## References

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