

## Correspondence

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### Dobutamine Stress Echocardiography

*To the Editor:*

Patients with coronary disease and ventricular dysfunction constitute a heterogeneous population, and there is still much debate surrounding their selection for revascularization procedures because of their uncertain outcome and higher operative risk.<sup>1</sup> Recent research has centered on developing and defining the much-needed reliable and accessible tools to assess residual myocardial viability in asynergic regions.<sup>2</sup> There is a paucity of data concerning the postreperfusion outcome of still-viable areas with persistent functional impairment far from the acute setting of infarction (ie, the hibernating myocardium).<sup>3,4</sup> Cigarroa et al<sup>5</sup> should be congratulated for their interesting contribution to this field; their findings regarding the prediction of recovery of left ventricular function after revascularization by using dobutamine stress echocardiography (DSE) appear to have clinical relevance. We have several doubts, however, regarding their results.

The investigated population should be better described, in particular regarding the selection criteria for revascularization procedures; it is unclear why only some of the patients underwent revascularization after DSE. Although the authors excluded from the study those subjects with *unstable* angina, it is not indicated how many of the patients complained of *stable* angina; in patients with advanced coronary disease and symptomatic ischemia, revascularization is advisable if feasible, irrespective of the DSE result. In our experience, the presence of angina by itself appears to predict the DSE result. In 21 patients with angina and advanced coronary disease, depressed (ejection fraction,  $34 \pm 8\%$ ) ventricular function, and preserved ( $>50\%$  of peak activity at quantitative analysis) <sup>201</sup>Tl uptake in 89% of 124 severely asynergic myocardial segments, functional improvement at DSE was observed in 90 segments (73%).<sup>6</sup> Conversely, in an additional 21 angina-free patients with ischemic ventricular dysfunction (ejection fraction,  $27 \pm 13\%$ ) and a comparable amount of residual viability at thallium scan ( $>50\%$  uptake in 83% of 180 abnormal segments), we found a contraction improvement at DSE in only 48 segments (27%,  $P < .001$ ). Of note, our ejection fraction values are similar to those reported by Cigarroa et al in their subgroup of patients with and without contractile reserve by DSE.

Regarding the outcome of the 25 patients who underwent successful revascularization (Fig 3 in Cigarroa et al), 9 of 14 patients who had negative preoperative DSE did show some improvement in regional wall thickening, although in only 2 was the improvement "significant" (ie, above the arbitrary cutoff value of "thickening improvement" established for rest-stress comparison but not for preoperative-versus-postoperative comparison).

Observational data are the main source of concern about the clinically contributive role of accurate techniques aimed at the assessment of viable myocardium, such as <sup>201</sup>Tl imaging or positron emission tomography.<sup>7-9</sup> We agree with Cigarroa et al that DSE is readily available and relatively inexpensive; however, whether it is as accurate as the reliable nuclear techniques in the identification of residual viability and those patients with impaired left ventricular function who are most likely to benefit from coronary revascularization is unsettled.

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### Reply

We appreciate the interest of Dr Galli and colleagues in our recent prospective study of the value of DSE in identifying contractile reserve of abnormal myocardial segments and predicting recovery of left ventricular function after revascularization.<sup>1</sup> With regard to the description of the patient population, all of our patients had angina pectoris, which, of course, was the primary indication for cardiac catheterization. We did not believe that it was advisable to perform DSE in patients with ongoing unstable angina, which we defined as angina at rest. Patients with increasing frequency of exertional angina were included, as were patients in whom unstable angina had been successfully "cooled off" with medical therapy.

Of the 49 patients who underwent DSE, revascularization was attempted in 29. As stated in the study, 6 patients did not undergo revascularization because they were thought to be at high risk due to severely impaired left ventricular function. The remaining 14 patients either had unsuitable anatomy, refused revascularization, or had two-vessel disease with minimal symptoms after medical therapy.

We strongly disagree with the remark of Dr Galli and colleagues about the "arbitrary cutoff value" for defining contractile reserve. First, it should be emphasized that we chose to define contractile reserve in terms of patients rather than in terms of segments. If one analyzes the data in terms of segments, Dr Galli would be correct that patients with viable segments tend to have angina, whereas patients without viable segments do not. On the other hand, a patient with a huge apical aneurysm, severe left ventricular dysfunction, but a single viable posterobasal segment would not be