Risk Stratification With Electrocardiographic-Gated Dobutamine Stress Imaging

We read with interest the study by Navare et al. (1). We congratulate the authors for the original contribution by showing that the combination of function and perfusion assessment with this technique improves risk stratification. We were, however, concerned about the high event rate of 2.4% in patients with normal perfusion and function. The investigators pointed to the fact that inability to exercise is associated with adverse outcome regardless of the results of stress testing, which has been confirmed by previous studies (2). An important explanation would also be the fact that many of the patients who have a contraindication for vasodilator stress are likely to have dyspnea. The recent study by Abidov et al. (3) as shown that dyspnea is associated with worse survival among those with and without coronary artery disease referred for nuclear stress testing.

Another major reason for the high event rate among patients with normal perfusion in this study is the exceptionally high rate of failure to achieve the target heart rate (33%), which is significantly higher than what is reported with dobutamine myocardial perfusion imaging in the U.S. (4) and Europe (5). Failure to achieve the target heart rate was related to an adverse outcome, which reflects a reduced sensitivity in that setting. The maximal achieved heart rate, dose, and frequency of atropine administration were not provided to verify effectiveness of the stress protocol. In their analysis of the subset of patients who achieved the target heart rate, the annual hard event rate was 1.5% among those with normal perfusion and function (1). However, the range of follow-up was not provided. Survival curves showed that some patients were followed for over 6 years. Because the curves tended to be steeper late during follow-up in patients with normal studies, it is likely that the event rate was lower than 1.5% in the first 2 years following the stress test. It is to be emphasized that comparing these results with exercise myocardial perfusion imaging studies that showed an event rate of <1% with normal perfusion should take into account the differences in the maximal duration of follow-up and the fact that the target heart rate was achieved more frequently in the exercise studies.

Therefore, we believe that dobutamine myocardial perfusion imaging may still identify a lower-risk population within 2 years of follow-up, when the target heart rate is achieved, with figures closer to the reports from European centers in patients who do not necessarily have a contraindication for vasodilator stress (6,7). The flow heterogeneity obtained by high-dose dobutamine–atropine stress was shown to be equal to that obtained by dipyridamole (8,9). The relatively high event rate among patients with normal perfusion in this study is likely due to the unique characteristics of the study patients and the reduced sensitivity in the 33% of patients who failed to achieve the target heart rate.

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doi:10.1016/j.jacc.2006.03.065

REFERENCES


REPLY

We appreciate the interest in our study by Elhendy et al. (1). They raise a number of important issues, which are subsequently addressed:

1. We share the concern that patients with normal perfusion and function with dobutamine myocardial perfusion imaging (MPI) have higher event rates than do those with similar results after exercise MPI. A primary goal of our work was to confirm or deny a previous report in a “high-risk population” in which patients were selected for dobutamine stress only if they were unable to undergo exercise or vasodilator stress. Our results confirm those reported by Calnon et al. (2), and extend the observation that, despite normal function, those with normal perfusion still have higher event rates. We acknowledge that when dobutamine MPI is used as a primary stressor in an unselected population, a normal dobutamine MPI identifies a low-risk population, and this was referred to in the Discussion section of our study (3–5).

2. In the recent study by Abidov et al. (6), dyspnea was coded only in patients who did not have chest pain as indication for stress testing. In our study, 87% of patients had a chest pain syndrome, 5% were preoperative, whereas only 8% had miscellaneous (congestive heart failure, abnormal electrocardiogram, etc.) indications. Thus, the prevalence of dyspnea as an isolated risk factor was small, and the contribution of dyspnea alone toward the higher event rate was minimal.

3. With regards to achievement of target heart rate, few studies have reported percentages. Hence, it is not clear whether the