Stress Imaging in Renal Transplant Candidates

To the Editor:

I read with interest the recent paper published by De Lima et al. A recent meta-analysis by Rabbat et al casts doubt on one conclusion of De Lima et al, as Rabbat et al found that noninvasive stress imaging was predictive of acute myocardial infarction and cardiac death in renal transplant candidates. De Lima et al’s findings regarding the accuracy of dipyridamole single-photon emission computed tomography (SPECT) thallium for prediction of coronary anatomy are generally concordant with previous publications (with the notable exception of Dahan et al, who employed a novel stress protocol utilizing combined dipyridamole and exercise thallium imaging in hemodialysis patients).

The findings of De Lima et al regarding dobutamine stress echocardiography are difficult to accept in the context of conventional clinical practice. Specifically, the authors in the present study did not administer atropine to augment the heart rate response during the administration of dobutamine. It would be helpful for the authors to provide data on systolic blood pressure and heart rate achieved in the study patients. The diagnostic sensitivity of dobutamine stress echocardiography will be strongly influenced by the heart rate achieved. The low sensitivity reported in this study may be attributable to inadequate levels of stress in these patients. In our study we administered atropine to patients as part of the stress imaging protocol and used a maximum target systolic pressure of 240 mm Hg. In our study 48% of the patients attained target heart rate ([220−age]×0.85). Importantly, it was necessary to administer atropine in 50% of our patients to augment the heart rate response.

Finally, in our study of dobutamine stress echocardiography all patients underwent quantitative coronary arteriography irrespective of test result, so that there was no issue of referral bias. Our project was conducted in the era before the availability of contrast echocardiography and harmonic imaging. Nevertheless, in a study utilizing a true prospective design we found sensitivity and specificity of dobutamine stress echocardiography of 75% and 71% for prediction of quantitative coronary arteriographic stenosis greater than 70%, and 75% and 76% respectively for visually estimated stenosis greater than 75%. In the modern day era of stress echocardiographic imaging the accuracy of the technique is likely to be even higher, as we employed technology that has been obsolete for more than 5 years.

I agree with the authors’ contention that noninvasive stress imaging continues to be an imperfect technique for the evaluation of coronary artery disease in renal transplant candidates. The accuracy of dobutamine stress echocardiography reported in their publication, however, is not representative of the overall accuracy of this particular stress imaging technique.

I share a long-time interest in coronary artery disease screening in renal transplant candidates with the authors. To the best of my knowledge, however, I was not involved in research in this area in 1966 (see Reference 11 in their paper) nor have I had any prior publications in the journal Transplantation.

Charles A. Herzog
US Renal Data System and University of Minnesota
Minneapolis, Minn


Response

We are pleased for the interest shown by Dr Herzog in our report and for the opportunity to clarify some aspects of the methodology used in our work.

We did administer atropine although this information was not mentioned in the Methods section. In our institution we routinely follow the protocol by McNeill et al that adds atropine to the stress echocardiography. In our report, atropine was administered up to 2 mg IV in patients not achieving 85% predict maximum exercise heart rate under maximum dose of dobutamine (40 micrograms/kg/min). This dose of atropine was indeed higher than that reported by Herzog et al. Only patients that achieved target heart rate were included in our analysis, including those that received atropine (62%). Therefore, we believe that the differences observed between our findings and those reported by Herzog et al could not be explained by the differences in the use of atropine. Age, gender, and the prevalence of diabetics as well as the maximum target systolic blood pressure (220 and 240 mm Hg, respectively) were also comparable in both publications. On the other hand, only 10% of Herzog’s patients were receiving β-blockers contrasting with 32% in our sample. Of course, it remains speculative if this fact could have any influence on our results. It is also important to point out that 16% of our patients had the test interrupted mostly because of dangerous increase of blood pressure. In our view this should be considered also a limitation for the application of the test in this population. So much so that half of the patients that could not finish the test because of hypertension had significant (at least 70%) coronary stenosis on angiography.

We apologize for the error in Reference 11 by Vandeberg et al that we now will correct.

Jose Jayme G. De Lima
Heart Institute
São Paulo, Brazil

Emil Sabbaga
Renal Transplant Unit
Hospital das Clínicas
University of Sao Paulo Medical School
São Paulo, Brazil

Marcelo Luis C. Vieira
Heart Institute
São Paulo, Brazil

Flavio J. de Paula
Luiz E. Ianhez
Renal Transplant Unit
Hospital das Clínicas


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Charles A. Herzog

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