The Devil Is in the Detail

To the Editor:

We read with interest the recent article by Sauer and colleagues [1]. This group comprises leaders in cognitive outcomes following anesthesia and surgery, and they are to be congratulated for their contribution to this field of research. We wish to draw attention to a number of shortcomings in this manuscript that we think might assist in further interpretation of the findings.

It would be helpful to have the authors discuss and justify the novel approach of combining paper-and-pencil tests with computerized neuropsychological tests as one assessment battery in more detail.

Statistical analysis is the key to interpreting results. The authors state that they used no threshold criteria for multivariable analysis, which may be appropriate if they intend to model fit their data, including investigation of colinearity, confounding, and interactions. As far as we were able to find, there is no presentation of this data. The authors provide no information regarding the variables assessed for univariable associations, nor do they provide details of the multivariable analysis. This is a major shortcoming and precludes the reader from meaningful interpretation of the study. The authors go on to say that they performed post hoc analysis stratifying for age and education, but do not offer any details of how they chose cut points for these strata, nor what the cut points were.

The authors discuss the contribution of “demographic variables,” but do not elaborate on which demographic variables they have identified as being contributors. This data is required in order for other investigators to verify the results.

The normative data is not referenced, nor is there any detail of how it was matched to the patient group, whether they were healthy norms, or whether they were relevant aged norms with comorbidities similar to patients undergoing percutaneous coronary intervention (PCI) or coronary artery by pass grafting (CABG). Importantly, the analysis using normative data demonstrates little difference between groups, and this is not discussed.

The conclusions drawn from the analysis are questionable. To conclude a significant contribution of demographic variables without providing their analysis does not inform the reader of any meaningful detail. Additionally, it is entirely inappropriate to conclude superiority (“the off-pump CABG group was superior to the PCI group”) based only on univariable analysis.

We would be most grateful if the authors could address these shortcomings.

Lisbeth A. Evered, PhD
Centre for Anaesthesia and Cognitive Function
Department of Anaesthesia
St. Vincent’s Hospital
PO Box 2900
Fitzroy 3065
Victoria, Australia
e-mail: lis.evered@svhm.org.au
and
Melbourne Medical School
University of Melbourne
Victoria, Australia

David A. Scott, PhD
Centre for Anaesthesia and Cognitive Function
Department of Anaesthesia

Reference

Reply

To the Editor:

We thank Dr. Evered and colleagues [1] for their interest in our randomized study comparing cognitive outcomes after angioplasty and off-pump coronary bypass grafting [2].

It is not uncommon to combine paper-and-pencil tests with computerized tests. Neuropsychologic tests covering relevant cognitive domains were selected on the basis of consensus meeting recommendations and supplemented with computerized tests because of excellent measurement characteristics and acceptable patient burden. Age-matched normative data of healthy Dutch subjects were available for most tests [3, 4], allowing indication of cognitive dysfunction. The CogState collaboration provided normative data for the computerized tests, and data from the 2002 User Instruction were used for the Grooved Pegboard. Our findings suggest that important cognitive complications do not differ between procedures.

The appropriate primary analysis in this randomized study is a univariable analysis. We performed an additional multivariable analysis to correct for possible differences between groups attributable to selective loss from follow-up. As we aimed to correct for all potential confounders, all variables were added into the regression model at once without the use of any threshold criteria. A significant estimate for age, gender, and educational level was found. In combination with the attenuation of the revascularization mode effect, this suggests that these demographic factors may be more important for cognitive outcome. We have chosen not to present the entire multivariable model, given that the focus of our analysis was on the effect of mode of revascularization. For the post-hoc stratified analyses, an age cutpoint of 65 years was chosen, and education was divided in Verhage levels 1 to 4 and 5 to 7.

Overall better cognitive performance by the off-pump coronary artery bypass grafting group was shown in the primary univariable analysis but not in the multivariable analysis. We therefore believe that our conclusion stating that patients had a similar or perhaps even better cognitive performance after