CABG Effects On Cognition Resolve Quickly

Michael Smith

The cognitive impairment often reported after on-pump coronary artery bypass grafting (CABG) usually resolves within 8 weeks of the procedure, researchers reported.

And, in a controlled study, more than half of CABG patients had no significant impairment a week after surgery, according to Stephen Robinson, PhD, of RMIT University in Bundoora, Australia, and colleagues.

What's more, a quarter of patients improved their cognitive abilities above preoperative levels, Robinson and colleagues reported in the April issue of the *Annals of Thoracic Surgery*.

The analysis suggests that so-called postoperative cognitive dysfunction is largely a function of surgery combined with anesthesia – not the CABG procedure specifically -- while depression, anxiety, and stress also play an important role, the researchers concluded.

The researchers noted that earlier studies have pegged the risk of cognitive dysfunction after CABG surgery at up to 65% at the time of discharge and up to 40% several months later.

But "previous research may have overestimated the effects of cardiac surgery on cognition," Robinson said in a statement. "Cognitive changes that occur immediately after surgery are likely due to confounding factors and will generally resolve within a few months."

The researchers compared cognitive functioning in three groups – 16 patients scheduled for elective on-pump CABG, 15 slated for elective thoracic surgery (biopsies or lobectomies), and 15 nonsurgical control participants recruited from retirement villages.

The groups were comparable in age, education, sex, and premorbid intelligence quotient, Robinson and colleagues noted. The age range of the entire cohort was 51 to 80.

All participants were tested three times on a battery of cognitive tests and an emotional state assessment. The surgical patients were tested preoperatively, and at 1 and 8 weeks postoperatively; the nonsurgical participants were tested at an initial assessment, and again 1 and 8 weeks later.

Data from the two surgical groups were normalized against information from the nonsurgical control group to minimize the performance advantage of repeated testing, the researchers reported.

Robinson and colleagues found that, as a group, the CABG patients did worse than the other surgical patients on every test both before and after surgery, although most of the differences failed to reach significance.

When the researchers adjusted for the effects of anxiety, stress, and depression, most of the differences were no longer seen, they reported.

Importantly, individual performances did not necessarily reflect the group differences.

Robinson and colleagues defined cognitive impairment as a significant decrease in performance from the preoperative level on at least 20% of the subtests, and improvement as a significant increase on the same proportion of subtests.

By that standard, they found that seven patients from the CABG group (or 43.8%) were impaired a week after surgery, compared with five patients (or 33.3%) from the surgical control group.

At 8 weeks, they found, only one CABG patient remained impaired, and all the impaired thoracic surgery patients had returned to preoperative levels (although one patient who was not impaired at 1 week became so at 8 weeks).

The researchers also observed cognitive improvement -- 8 weeks after the operation, four CABG patients (25%) showed "significant cognitive improvement" from preop values, and 11 (68.8%) showed no significant change.

In comparison, two patients in the thoracic surgery group (13.3%) showed significant cognitive improvement, and 12 (80%) showed no significant change.

The implication is that "a small proportion of patients drove the main effects seen at the group level," Robinson and colleagues argued.

An important take-home message from the study is that it appears to be the operation itself – rather than specific factors of the CABG surgery – that affects cognition, commented Ola Selnes, PhD, of Johns Hopkins University, in an accompanying commentary.

He noted that the analysis also implicated both stress and depression in postoperative cognitive effects, although the mechanism is unclear.

One implication, Selnes said in a statement, is that "identifying and treating preoperative depression may be one approach to minimizing the risk of postoperative cognitive decline."

The study implies that patients can be reassured that on-pump CABG surgery is not associated with worse neurological outcomes than other types of revascularization, he added.

"The choice of procedure should be guided by what is good for the individual patient as opposed to the risk of adverse neurological outcomes," Selnes said.

Robinson and colleagues noted potential confounding variables such as age and education, but in the study, those variables were comparable. A difference in anesthesia duration also is a potential confounder, but they found no meaningful correlations with cognitive subtests.

However, the sample size was small and researchers said that "it would be important to determine whether this outcome is maintained in a larger study."

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