Cognitive Decline after Surgery and Illness

To the Editor:
We read with interest the article on long-term cognitive decline by Avidan et al. We believe that there are several shortcomings in the study that need addressing.

The authors outline some of the limitations of the study but fail to emphasize the inherent problems of all retrospective studies, ranging from data entry to biases both known and unknown. Indeed, the very best conducted retrospective study can provide level 3 evidence only and indicate the need for prospective randomized controlled trials. The accompanying editorial outlines some of the methodologic issues of randomized controlled trials investigating postoperative cognitive dysfunction (POCD). However, to suggest any issues confronting prospective studies may be overcome by retrospective studies is fanciful.

The authors mention that POCD is an “ambiguously defined clinical condition that has no universally accepted diagnostic criteria.” They then proceed to use a composite cognitive score based on simulated data and the use of Clinical Dementia Rating (CDR) gradients, which has no precedent in POCD literature.

It has been established in the cardiac literature that POCD continues in the long term. Cognitive testing in the retrospective study by Avidan et al. varied from several months to many years between baseline and event. Given the likelihood of longitudinal cognitive impairment after surgery, it is inaccurate to consider such broad differences comparable.

There is a sound rationale supporting the fact that group analyses are inappropriate for studies of cognitive function and cognitive change. In this environment, group data obfuscate significant changes in individuals, and it is this very group of individuals who suffer POCD who should be the target of our research. This is even more important given our lack of knowledge of longitudinal POCD and any relationship between POCD and the cognitive impairment of aging, including mild cognitive impairment and Alzheimer disease.

The authors have completely ignored the part played by concurrent cerebrovascular disease in cognition. They note that patients with cardiovascular disease are known to perform poorly in tests of cognitive function compared with healthy controls but go on to include such patients in their cohort. Conversely, they have arbitrarily excluded subjects who underwent surgery, which is known to be associated with cognitive change.

Patients with vascular disease and even risk factors for vascular diseases such as diabetes, hypertension, and hyperlipidemia are known to manifest cognitive impairment. Autopsy findings confirm that cerebrovascular disease is present in more than a third of patients with mild cognitive impairment. Consequently, patients with a vascular disease are more likely to present with mild dementia (CDR of 0.5) than those without a vascular disease. They are also more likely to require surgery. Because Avidan et al. showed that this patient group declined in cognition at a faster rate than those who were rated as cognitively normal (CDR of 0), the analysis of the two groups (CDR of 0 vs. CDR of 0.5) would demonstrate that surgery was associated with cognitive decline. A similar argument would apply to major illnesses. In fact, 27% (32 of 119) of the major illness classifications in this article are cardiovascular related, and many more patients are likely to have risk factors for cardiovascular disease.

We suggest that the results of the current study be treated with caution but hopefully stimulate interest in this issue and the undertaking of well-conducted randomized controlled trials to provide sound evidence for the presence or absence of long-term cognitive change after surgery and illness.


References

1. Avidan MS, Scarleman AC, Storandt M, Barnett K, Vannucci A, Saager L, Xiong C, Grant EA, Kaiser D, Morris JC, Evers AS: Long-term cognitive decline in older subjects was not attributable to noncardiac surgery or major illness. Anesthesiology 2009; 111:954–70

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