Surgery, anesthesia not linked to long-term cognitive impairment in older adults

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New research suggests older patients should not feel reluctant to have quality of life enhancing surgeries due to concerns that undergoing anesthesia may boost their risk of developing cognitive issues. In a study of more than 8,500 middle-aged and elderly Danish twins published in *Anesthesiology*, the official medical journal of the American Society of Anesthesiologists (ASA), researchers found no clinically significant association between major surgery and general anesthesia with long-term cognitive decline.

"Our use of twins in the study provides a powerful approach to detect subtle effects of surgery and anesthesia on cognitive functioning by minimizing the risk that the true effects of surgery and anesthesia are mixed up with other environmental and genetic factors," said study lead author Unni Dokkedal, M.P.H., Unit of Epidemiology, Biostatistics, and Biodemography, University of Southern Denmark. "We found no significant cognitive effects related to surgery and anesthesia in these patients, suggesting that other factors, such as preoperative cognitive levels and underlying diseases, are more important to cognitive functioning in aging patients following surgery."

More than one in 10 people who have surgery are 65 or older and advanced age can affect the potential for surgical risks. Postoperative cognitive dysfunction for a few weeks after surgery is one of these potential risks, but the effects of surgery, anesthesia, pre-existing health conditions, and other factors have been unclear. Whether this short-term postoperative cognitive dysfunction leads to long-term memory loss and

lessened ability to learn, concentrate and think is uncertain, but the current study suggests it is unlikely.

In the study, researchers examined the association between exposure to surgery and level of cognitive functioning in a sample of 4,299 middle-aged twins younger than 70 and 4,204 elderly twins who were aged 70 or older. Results from cognitive tests of twins who had either major, minor, hip and knee replacement or other surgery within 18 to 24 years before cognitive examination were compared to the cognitive results of a reference group, comprised of twins who had no surgical procedures. Test results were also compared in an intrapair analysis of twins, one of whom was exposed to surgery while the other was not, to assess genetic and shared environmental confounding.

Twins who had undergone major surgery had slightly lower cognitive scores, compared to the reference group, but when compared to their twin, when genetic and shared environmental factors were adjusted, no association was observed. Interestingly, twins who had undergone hip and knee replacement surgery had slightly higher cognitive scores, but the difference was not statistically significant. No differences were found in the minor or other surgery group when compared to the reference group. The authors also analyzed data for patients who had undergone surgery from three months to two years before cognitive examination and found no effect of the short time interval between surgery and cognitive examination on cognitive function. The results suggest preoperative cognitive functioning and underlying diseases are more important for cognitive functioning in mid- and late life than surgery and anesthesia, the authors report.

"It is important to know whether surgery and anesthesia have any negative effects, especially with regard to preoperative counselling of the patient," said Dokkedal. "This research has the potential to become a key piece of this very complex research puzzle."

An accompanying editorial commented favorably on the study:

"On the basis of a growing body of evidence, of which the study by Dokkedal et al. is symbolic, older patients should today be reassured that surgery and anesthesia are unlikely to be implicated in causing persistent cognitive decline or incident dementia," said editorial authors Michael S. Avidan, M.B., B.Ch. and Alex S. Evers, M.D., Washington University School of Medicine in St. Louis. "The large number of patients and the use of rigorous longitudinal cognitive testing in the study increased the reliability of the findings."

In 2016, ASA will launch a patient safety initiative on improving brain health, fostering understanding, developing best practices and increasing awareness of postoperative cognitive dysfunction and delirium with the goal of laying the groundwork for research into minimizing its effects.

Provided by American Society of Anesthesiologists