Older Adult With Cognitive Impairment Undergoing Ambulatory Surgery: New Epidemiological Evidence With Implications for Anesthesia Practice

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Inceasing amount of data has emerged over the last few decades highlighting the prevalence of cognitive impairment in the surgical population.1–3 More recently, researchers have been able to document rates of cognitive impairment with the help of retrospective (epidemiological) and prospective studies of cognitive stratification-based screening of patients using validated tools.4,5 For example, in a study of older orthopedic surgical patients, 24% screened positive for probable cognitive impairment using a Mini-Cog score ≤2.6 It is important to emphasize that cognitive impairment should be viewed as a spectrum that ranges from a mild impairment that is barely noticeable to full-blown dementia. Of note, recently the Nomenclature Consensus Working Group recommended aligning perioperative neurocognitive disorder terminology with existing Diagnostic and Statistical Manual for Mental Disorders-5 and the National Institute for Aging and the Alzheimer Association definitions.7 The suggested overarching terminology for perioperative cognitive changes is now “perioperative neurocognitive disorders,” which includes preoperative neurocognitive disorder, cognitive decline diagnosed up to 12 months postoperatively, and acute (eg, delirium) and delayed (eg, cognitive decline) neurocognitive recovery.

With the world population aging, patients >65 years of age are offered surgical procedures in an ambulatory setting with increasing frequency. Aging is associated with a higher burden of comorbid conditions including neurocognitive disorders such as cognitive impairment.6 It is well recognized that preoperative cognitive impairment is associated with an increased risk of adverse events after surgery including perioperative neurocognitive disorders and may act as a proxy for central nervous system dysfunction, which can increase postoperative morbidity and mortality and may also help predict patient’s response to anesthesia.8,9 However, the prevalence and predictors of cognitive impairment in the ambulatory surgical population have not been adequately addressed in the literature.

The study by Gaulton et al,10 published in this issue of Anesthesia & Analgesia, used recent survey data from Health and Retirement Study to investigate the prevalence and predictors of cognitive impairment in the outpatient surgery setting. They are the first to report prevalence rates of preoperative cognitive impairment in this patient population using a large, US-based sample. The Health and Retirement Study is a longitudinal survey of participants ≥65 years of age Americans conducted every 2 years.11 Using several years of survey data, the authors established that there is possible cognitive impairment in 1 of 6 adults in this population, with a higher prevalence in patients >85 years of age. This prevalence is slightly lower than what has been reported in the general population.12 In addition, they identified several risk factors for cognitive impairment such as non-Hispanic African American race, lower socioeconomic and education levels, male gender, history of stroke, and preoperative functional dependence. Another interesting finding, given the longitudinal nature of the survey, was that in patients with likely cognitive impairment, over half had a decrease in their cognition in the 4 years before surgery. Despite being a retrospective review of existing survey data, this pilot study adds to our current knowledge by specifically targeting outpatients.

Although the study by Gaulton et al10 provides us with a population-based epidemiological evidence of the burden of cognitive impairment in the outpatient surgical population, there are several limitations. First, limitations inherent to the Health and Retirement Study database itself. The nature of data collection (ie, patient self-reported or surrogate-reported medical conditions and demographic information) relies on patient recall. Thus, recall bias with self-reported data is a potential confounder, which may lead to underreporting or overreporting of outpatient surgery. Also, one would think that data collection in cognitively impaired individuals may be even less accurate, although previous studies using Health and Retirement Study have shown a
correlation between self-reported data and data obtained from insurance claims or from measurements from in-person interviews. In addition to the aforementioned patient recall bias, the results may also be influenced by ascertainment bias and the potential introduction of systematic errors that arise from having a nonrepresentative sample. Of note, 90% of the sample were Caucasian patients, yet the authors concluded that non-Caucasian race is a risk factor even though these patients are clearly underrepresented in the study sample. Non-Caucasian patients may have a number of complicating factors that would need to be considered such as socioeconomic and health status. This represents a research gap for future investigations.

It is worth noting that survey participants having surgery had less prevalence of cognitive impairment versus those who did not have surgery. Thus, the study raises an interesting question of whether patients with cognitive impairment are offered outpatient surgery less often than individuals with normal cognition. However, the study is unable to answer this question. Also, the information on the type of surgical procedure or the type of anesthesia was not available. It is possible that the patients with cognitive impairment were offered relatively minor surgical procedures. It would be helpful to see if cognitive impairment has any impact on the outcomes after ambulatory surgery, which is not possible with the Health and Retirement Study dataset but could form the basis for future research. One solution might be to link these survey data to another dataset which reports patient outcomes.

We know that not every patient may be suited for outpatient surgery. The decision is usually made based on a combination of factors such as surgical complexity, type of facility, patient comorbidities, social situation, and the ability to comply with postdischarge instructions. The goal of outpatient surgery is to discharge the patient home without significant delays, while also making sure that they can safely continue to recover at home. As several nonambulatory studies suggest, patients with cognitive impairment have longer hospital stays, more complications, and greater morbidity. Longer stays after ambulatory surgery may reduce the efficiency of an ambulatory surgery center, and postoperative complications may increase the incidence of unplanned hospital admission. Furthermore, if presence of cognitive impairment were to increase postdischarge complications, there may be an increase in emergency room visits and hospital readmission rates. These issues would negate the benefits of performing a surgical procedure in an ambulatory setting.

Given that outpatient surgery, on average, tends to be lower risk than inpatient surgery, one question is whether outpatients with cognitive impairment are less likely to experience postoperative complications. Preliminary studies have suggested that cognitive function is minimally impaired after ambulatory surgery, yet the influence of type of anesthesia on postoperative cognitive function remains controversial. For example, Ward et al suggested that ambulatory patients undergoing general anesthesia may be at an increased risk of perioperative neurocognitive disorders, although the authors admitted that the overall risk may be rather small. In contrast, Dokkedal et al reported that preoperative cognitive function and underlying diseases are more important for postoperative cognitive functioning than the type of surgery and anesthesia. Of note, several studies assessing outcomes after implementation of enhanced recovery pathways, akin to performing the procedure on an outpatient basis, have reported a lower incidence of postoperative delirium and cognitive dysfunction. Thus, the use of fast-track anesthesia techniques with aggressive pain prophylaxis using nonopioid analgesics is emphasized.

Older adults may benefit from performing the surgical procedure in an ambulatory setting as it allows recovery in the familiar “home” environment with minimal disruption to their daily routine. They are less able to adapt to unfamiliar environments, and hospitalization is associated with sleep deprivation, immobilization, and medication errors. However, it is imperative that clinicians caring for the aging population in the ambulatory setting recognize that these patients do need specialized care, particularly after discharge home. The first step is to identify patients at higher risk of perioperative neurocognitive disorders. Preoperative cognitive testing can help better identify patients who may be at risk for postoperative complications and warrant an intervention. In addition to cognitive impairment, presence of comorbid conditions, functional impairment, and frailty are associated with increased postoperative complications and perioperative neurocognitive disorders, specifically postoperative delirium. Functional impairment and frailty are measures of decreased physiological reserve that results from impairments in multiple organ systems and can be distinguished from the aging process and comorbidity. Therefore, preoperative evaluation in the older patients should include assessment for functional impairment and frailty. More aggressive medical optimization and prehabilitation to address frailty could improve postoperative outcome. Also, this patient population may require additional preoperative counseling and shared decision making about risks and benefits of the procedure and the possible need for enhanced support after discharge home. Subsequently, based on the patient’s cognitive status and associated comorbid conditions, it may be determined that the patient is not an appropriate candidate for outpatient surgery. Because failure to recognize postoperative delirium is common, it is necessary to educate the recovery room nursing staff to identify delirium. However, many of these patients may be discharged before any signs and symptoms of delirium manifest. Therefore, family members and caregivers should have access to validated tools such as the Family Confusion Assessment Method (FAM-CAM) to make patient assessments at home.

In summary, the older adults, particularly those with cognitive impairment, are at a higher risk of perioperative complications. Because undiagnosed cognitive impairment and frailty are common and failure to recognize these issues is one of the major causes of perioperative complications, they need significant attention. With limited understanding of the postoperative (particularly postdischarge) course, any recommendations regarding scheduling and management of these patients for outpatient surgery remain speculative. Finally, developing and implementing clinical pathways is the best approach to reduce adverse events and improve perioperative outcomes.
REFERENCES