Postoperative Cognitive Dysfunction in Older Adults
A Call for Nursing Involvement

ABSTRACT
As the population continues to age and new medical developments make surgery at advanced ages increasingly possible, it is important to consider how older adults tolerate surgery and anesthesia. Considerable evidence shows that older adults have a higher risk of developing postoperative cognitive dysfunction (POCD), which leads to transient and sometimes long-term cognitive changes that may affect quality of life. Because little is known about how to prevent or treat POCD, it is important that nurses identify ways in which they can intervene to help patients who experience this disorder. [Journal of Psychosocial Nursing and Mental Health Services, 52(11), 17-20.]

Older adults are the fastest growing segment of the population, and they undergo 25% to 30% of all surgical procedures (Monk & Price, 2011). As the population continues to age and new medical developments make surgery at advanced ages increasingly possible, all individuals caring for older adults during the perioperative period and after discharge should be aware of the potential development of postoperative cognitive dysfunction (POCD).

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CASE EXAMPLE

Mr. Canfield, who lives independently at age 84 with good mental and physical status, was seen in the emergency department for symptoms of severe abdominal distention and pain. Tests confirmed that he had a bowel obstruction caused by a malrotation, in which the bowel was kinked, preventing any passage of contents and threatening circulation to the bowel; immediate surgical intervention was needed. The anesthesiologist visited Mr. Canfield prior to surgery to ask whether he had any previous problems with anesthesia that should be noted. Mr. Canfield said that he had not; he had several surgeries during the past few years and all had gone well.

The abdominal surgery was performed without complication, and within a few hours, Mr. Canfield was back in his hospital room, talking, joking, and feeling fairly comfortable. However, later that evening, he complained of blurred vision and appeared anxious. He was unable to sleep that night. He told the nurse the next morning that he was exhausted but that when he would start to fall asleep, he would jerk awake. That evening, he was more anxious and began to hallucinate. “See that clock on the wall?” he told the nurse. “A few minutes ago, it was down on the floor, and the door to the room had also moved over by the clock but was miniaturized.” Concerned about this change in condition, the nurse paged Mr. Canfield’s physician, who examined him and determined that his symptoms did not warrant further tests at that time.

Over the next few days, Mr. Canfield’s physical condition improved. He experienced little abdominal pain, was able to walk on the unit without assistance, regained bowel sounds, and progressed to a regular diet. He still experienced anxiety, sleeplessness, and occasional hallucinations, but because he was making good progress physically, he was discharged home.

Mr. Canfield described the next weeks as miserable. His blurred vision, anxiety, and hallucinations continued. He laid awake at night for hours at a time. His walking became unstable and he worried that he was going to fall. He also described feelings of depression—a state of mind that was uncharacteristic for him. At his 1-week postoperative medical visit, he described the symptoms to his physician; he was reminded that recovery took longer at his age and that the symptoms would pass. However, his daughter, who lived nearby, was shocked at the downhill spiral of her father and spent hours looking online to see if she could find anything that would explain his continued problems. Finally, she found a condition that seemed to fit his symptoms exactly—POCD.

Because so little is known about how to prevent or treat postoperative cognitive dysfunction, it is important that nurses identify ways in which they can intervene to help patients who are experiencing this disorder.

POSTOPERATIVE COGNITIVE DYSFUNCTION

In 1955, P.D. Bedford first described the adverse effects of anesthesia on older adults. After a retrospective review of 1,193 patients older than 50 who had surgery under general anesthesia during a 5-year period, he found that cognitive problems occurred in approximately 10% of patients. As a result of this review, he concluded that the cognitive decline was related to anesthetic agents and hypotension (Monk & Price, 2011). Bedford recommended that “operations on elderly people should be confined to unequivocally necessary cases” (Cottrell & Hartung, 2012, p. 80). It was not until 43 years later that the first large prospective study describing POCD following noncardiac surgery was published; the first International Study of POCD (ISPOCD) demonstrated that 25% of patients had cognitive dysfunction at hospital discharge, and 10% had measurable cognitive changes 3 months after surgery (Cottrell & Hartung, 2011; Monk & Price, 2011).

POCD is defined as “deterioration of cognition that is temporally associated with surgery and anesthesia” (Miller, 2014, para. 3). In reviewing the literature on this disorder, it is evident that delirium and POCD are often reported as being part of the same continuum of postoperative cognitive impairment, but they are two different entities. Delirium is an acute change in cognition that develops in the immediate postoperative period with marked fluctuation in attention and orientation, often with either agitation or lethargy. Cognitive changes with POCD are much more subtle (Krenk, Rasmussen, & Kehlet, 2010; Wofford & Vacchiano, 2011).

POCD can range from mild to severe and last for weeks to months, with a small minority of patients experiencing permanent decline (Mason, Noel-Storr, & Ritchie, 2010; Tanner, 2009). As demonstrated by symptoms experienced by Mr. Canfield, POCD often leads to anxiety, disturbance of the sleep–wake cycle, and depression. Other symptoms that may extend over a long period of time include memory loss, reduced ability to concentrate or process information, and difficulty handling everyday tasks. These cognitive changes may lead to significant functional impairments, including loss of independence and...
decreased quality of life (Krenk et al., 2010; Monk & Price, 2011).

Specific long-term outcomes of POCD are not clear, as the longest follow-up study was published by the ISPOCD in 2009. Findings from some studies have suggested that cognitive dysfunction after noncardiac surgery may be associated with increased mortality or development of Alzheimer's, Parkinson's, or Huntington's disease, but further research is needed to clarify these associations and identify older adults who are most at risk for POCD (Cottrell & Hartung, 2012).

The incidence of POCD is difficult to evaluate, as research studies have not used consistent methodologies (Monk & Price, 2011; Tanner, 2009). A review of several studies of patients who underwent coronary artery bypass graft surgery suggested that 33% to 60% of patients experienced POCD at 1 week postoperatively; the symptoms of POCD decreased to 4% to 20% at 3 months (Tanner, 2009). For non-cardiac surgery, research suggests that approximately 10% to 20% of older adults experience POCD symptoms 3 months postoperatively, although some studies show rates as high as 50% at hospital discharge and 30% at 3 months after discharge (Rundshagen, 2014; Tanner, 2009).

Research since Bedford's 1955 study of postoperative cognitive changes after anesthesia has identified various factors associated with POCD; however, the specific etiology is still unknown, and no broadly applicable evidence-based practices exist to prevent or treat POCD (Wofford & Vacchiano, 2011). Various factors, including type of surgery and anesthetic agent, prior stroke, lower education, alcohol abuse, and depression, may place older adults at greater risk for POCD (Miller, 2014; Tanner, 2009; Wofford & Vacchiano, 2011). Increasing evidence suggests that older adults with impaired cognitive status preoperatively are at greater risk for POCD (Monk & Price, 2011). However, the single most important risk factor appears to be age. Patients older than 65 are more likely to experience POCD, and it is more likely to continue for a longer period of time (Cottrell & Hartung, 2012; Miller, 2014; Tanner, 2009).

NURSING IMPLICATIONS

When the literature related to POCD was reviewed for the current article, only three articles were found that were published in nursing journals, and only one was in an American journal (Wofford & Vacchiano, 2011). Because so little is known about how to prevent or treat POCD, it is important that nurses identify ways in which they can intervene to help patients who are experiencing this disorder.

Neuropsychological testing is necessary to diagnose POCD, but because more than 70 different neuropsychological instruments have been used to quantify POCD, these tests should be administered by trained professionals both preoperatively and 1 to 3 months postoperatively; these tests are not practical to administer during hospitalization (Wofford & Vacchiano, 2011). Thus, most symptoms of POCD are noted through observations of patients and by family members and caregivers.

As illustrated by the experience of Mr. Canfield, older adults may be mystified why symptoms such as anxiety, sleeplessness, and hallucinations are occurring, and they need to know that they occur for a reason. Internet blogs reflect the concerns of patients and family members wanting to know why these symptoms occur. Nurses in all health care contexts need to be aware of the potential for older adults to experience POCD and offer supportive care for symptoms. Patients, family members, and caregivers can be reassured by knowing that if symptoms of POCD are observed shortly after surgery, 69% to 77% of cases resolve without intervention within 3 months, as medication effects, sleep disruption, and general stress associated with surgery diminish (Wofford & Vacchiano, 2011).

Because no specific treatment exists for POCD, creative interventions are needed for nurses to anticipate older adults' needs while they are experiencing symptoms. It is important to target the precipitating cause for a symptom or behavior. In Mr. Canfield's case, it was a nurse in the hospital who realized that his blurred vision was caused by the awkward angle created by him trying to see through his bifocal glasses while lying flat in bed. Patients or family members may ask for medications to treat anxiety and depression, but some medications may actually increase the symptoms. Non-pharmacological interventions can be especially helpful for older adults because they are low cost and have minimal side effects.

Older adults with POCD may have pain from a recent surgical incision or some ongoing chronic disorder (e.g., arthritis), and untreated pain can intensify behavioral problems. A structured exercise program can help ease pain and also improve the older adult's emotional outlook (Kolanowski, Resnick, Beck, & Grady, 2013). One study with older adults with dementia demonstrated that tailoring specific activities to an individual's personality and interests resulted in increased engagement and alertness, as well as decreased anxiety and passivity, as compared with nontailored activities (Kolanowski et al., 2013). Massage, music, adjustment of lights, and warm milk can help promote sleep.

One study found that a combination of high-intensity physical resistance strength training combined with walking and social activities was effective in increasing total nocturnal sleep (Kolanowski et al., 2013).

Nurses should educate older adults on important things to consider before consenting to a surgical procedure that is going to require anesthesia. Bedford's recommendation that "opera-
tions on elderly people should be confined to unequivocally necessary cases” (Cottrell & Hartung, 2012, p. 80) is still good advice today. The conservative first-do-no-harm approach should count anesthesia on the “cost” side of the cost–benefit equation when making decisions about whether to undergo a surgical procedure (Cottrell & Hartung, 2012). If the planned surgery is elective, nurses can help older adults weigh the risks and benefits of the procedure. Although it is not yet known how to prevent POCD, current research suggests that some anesthetic agents may be more toxic to the brain than others. Therefore, it is important to remind older adults to discuss past symptoms of POCD with their anesthesiologist before undergoing surgery.

Finally, a need exists for nursing research. In reviewing literature for the current study, no nursing research studies directly related to POCD were identified. Cann, Wilkes, Hall, and Kumar (2010) have suggested that it may be time to focus research at the viewpoint of the patient, instead of focusing exclusively on the type or methods of surgery and anesthesia. This focus would present a new body of individualized research. Nurses are in an excellent position to implement research to explore perceptions of older adults and their families about what it is like to experience this disorder. Enhanced understanding of their experiences could help identify interventions to ease the symptoms of POCD and potentially limit long-term adverse outcomes.

CONCLUSION

POCD is a complicated condition that can lead to significant disabilities and is still poorly understood. The issue of geriatric anesthesia is not well studied. More research is needed to identify the etiology of POCD and methods to help prevent it. Meanwhile, nurses can provide important services by making older adults more aware of the problem, educating them about POCD, guiding decision making for future surgeries, intervening to help alleviate symptoms through nonpharmacological interventions, and implementing research focused on older adults’ experiences with POCD.

REFERENCES


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