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Postoperative delirium

Kimberly F. Rengel, Pratik P. Pandharipande, Christopher G. Hughes

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Vanderbilt University Medical Center, department of anesthesiology, Nashville, TN, USA

Correspondence:
Christopher G. Hughes, 1211 21st Ave. South, 422 MAB, Nashville, TN 37212, USA.
christopher.hughes@vanderbilt.edu

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Summary

Delirium in the perioperative period is a wide-reaching problem that directly affects important clinical outcomes. It is essential that anesthesiologists understand how to define and diagnose delirium, identify patients at high risk for developing delirium, recognize precipitating factors to appropriately adjust care plans, and manage patients who develop delirium in the acute postoperative period. Importantly, delirium remains underdiagnosed in the perioperative setting, but many screening and assessment tools are readily available to aid non-psychiatric trained personnel in identifying delirium. Finally, understanding and implementing strategies to prevent patients from developing delirium is of utmost importance, as evidence-based pharmacological treatments for delirium are minimal and have significant limitations.

Introduction

Delirium is a state of acute cerebral dysfunction that manifests as fluctuations in mental status. It is a common problem among all patients admitted to the hospital and has the potential to significantly alter patients' clinical outcomes. There are many risk factors that predispose patients to delirium including age, frailty, and preexisting comorbid conditions, as well as risk factors unique to the perioperative period, such as severity of concurrent illness, type of operation, and ICU admission after surgery [1]. Perioperative delirium should be of paramount importance to providers, as multiple studies in perioperative patients have found significant associations between development of delirium within the first few days of surgery and increased length of stay, higher cost of care, increased hospital readmission rates, higher likelihood of discharge to institution, prolonged cognitive impairment and dementia, and increased mortality [2–5]. Postoperative delirium occurs commonly, is underdiagnosed, and is associated with worse patient outcomes. Understanding the disease process, risk factors, and management is critical to improving the care provided to patients by anesthesiologists.

Definition

Identifying postoperative delirium requires an understanding of the definition of delirium: a disorder hallmarked by an acute disturbance in attention and cognition that is not explained by a preexisting neurocognitive disorder or severe reduction in arousability. Common characteristics of

altered attention include inability to direct, focus, sustain, or shift attention, and cognitive disturbances include impaired memory, disorientation, or perceptual disturbances [2,3,6–8]. Unlike the gradual onset of dementia, alterations in attention and cognition must be acute and fluctuate throughout the day. Importantly, delirium may be further classified into three subtypes based on psychomotor behavior: hyperactive, hypoactive, or mixed. Hyperactive delirium presents with agitation, restlessness, and hypervigilance. Patients with hypoactive delirium are lethargic with slowed mentation and decreased movement. Importantly, care providers are much more likely to miss a diagnosis of delirium in patients with hypoactive features [9]. Perioperative delirium may be further classified based on the time point at which delirium is diagnosed in relation to the surgical intervention. Emergence delirium refers to psychomotor agitation that occurs as the patient emerges from a general anesthetic. Post-anesthesia care unit (PACU) delirium refers to fluctuations in mental status occurring after emergence but prior to meeting criteria for discharge from a PACU. Once the patient is discharged from the PACU to the hospital ward or ICU, mental status changes that meet delirium diagnosis criteria are referred to as postoperative delirium.

Diagnosis

Diagnosing delirium in the perioperative setting is very important, but sedating and analgesic medications administered during perioperative care and the natural course of emergence from general anesthesia add complexity in reaching a diagnosis. The gold standard for diagnosis of delirium is a formal evaluation performed by a psychiatrist using The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria [9]. As time, feasibility, and available resources often preclude a formal evaluation in most hospital settings, a number of validated instruments have been developed to aid in rapid and reliable bedside diagnosis. No instruments have been specifically validated in the PACU setting; however, key features of existing instruments are applicable and useful in establishing a delirium diagnosis throughout the perioperative period. The critical first step in assessing a postoperative patient for delirium is to assess the patient's level of arousal, as the patient must be responsive to voice in order to complete assessment for delirium. Widely used arousal/sedation tools include the Richmond Agitation Sedation Scale (RASS) [10] and the Sedation Agitation Scale (SAS) [11]. Once an appropriate level of arousal is established and the patient is responsive to verbal stimuli, validated assessment tools available include: the Confusion Assessment Method (CAM), [12] the 4AT, [13] the Nursing Delirium Symptom Checklist (NuDESC), [14] the Confusion Assessment Method for Intensive Care Unit (CAM-ICU), [15] and the Intensive Care Delirium Screening Checklist (ICDSC) [16]. Regular use of a validated screening tool is critical in ensuring that delirium is not left undiagnosed. The previously listed screening tools are primarily validated for use in ward or ICU patients. In looking at early postoperative applications, studies have predominantly examined the NuDESC and CAM-ICU in the PACU. Specificity for delirium diagnosis was > 90% for both tools; however, neither tool was sensitive for PACU delirium [17]. Therefore, a positive result on one of these assessment tools is likely to be delirium, but existing tools are not adequate to identify all cases of delirium, especially those that are mild. Examination of delirium severity is an ongoing topic of research. Modifications to existing assessment tools have been made to establish delirium severity scales. Adapted from the CAM and CAM-ICU assessments where features were scored as present or not present, the CAM-S and CAM-ICU-7 tools determine severity by assigning a numbered scale (0–2) to each feature (fluctuation of mental status, inattention, altered level of consciousness, and disorganized thinking). The CAM-S tool has been validated as a measure of delirium severity and correlates to patient outcomes both in-hospital and post-discharge [18]. In the critically ill patient population, the CAM-ICU-7 severity scale has been validated, and severe delirium scores correlate with increased mortality [19]. Validated delirium assessment tools allow for rapid and consistent evaluation of delirium throughout the perioperative period. Further research into validated measures for the immediate postoperative and PACU period, however, are needed.

Prevalence

The prevalence of delirium in perioperative patients is highly variable based on the patient population, timing, location within the hospital, delirium subtype, and the selected assessment tool. Card et al. examined a cohort of 400 patients after non-cardiac surgery at various time points to characterize delirium in the immediate postoperative period. On observation of emergence from general anesthesia in the operating room, 19% of patients demonstrated hyperactive agitation [20]. The CAM-ICU tool was utilized in PACU where 37% of patients had delirium upon on arrival. Of those determined to have delirium, RASS scores were assessed to determine hypoactive versus hyperactive signs. On arrival to PACU, 47% displayed hypoactive signs and 53% presented with hyperactive signs. During the PACU stay, prior to meeting criteria for discharge from PACU, 16% of patients were found to be positive for delirium with 92% demonstrating hypoactive signs. Once patients met criteria for discharge from PACU as determined by the Aldrete score, 5% were positive for delirium [20]. In a smaller, more selective, study of patients > 70 years old, Neufeld et al. found that 45% of patients had delirium after meeting discharge criteria from PACU, indicating completion of recovery from anesthesia. Of the patients that experienced delirium throughout their hospital stay, 74% were positive for delirium in the PACU [2]. Postoperative delirium rates vary by type of surgery and procedure risk. Otolaryngology and general surgery have a lower risk at 12%