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Review Paper

Postoperative Delirium: Incidence, Risk Factors, and Clinical Implications

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Abstract

Postoperative delirium (POD) is a common and serious neuropsychiatric complication that occurs after surgical procedures, particularly among older adults and critically ill patients. Characterized by an acute and fluctuating disturbance in attention, awareness, and cognition, POD is associated with increased morbidity, prolonged hospital stay, higher healthcare costs, long-term cognitive decline, and increased mortality. Despite its clinical significance, postoperative delirium often remains

underdiagnosed and undertreated. This review aims to provide a comprehensive overview of postoperative delirium, including its definition, epidemiology, pathophysiology, risk factors, clinical features, diagnostic approaches, prevention strategies, and management. Understanding the multifactorial nature of POD is essential for early recognition and implementation of effective preventive and therapeutic measures

Introduction

Postoperative delirium is an acute neurocognitive disorder that develops in the immediate postoperative period, typically within hours to days following surgery. It is characterized by afluctuating course of altered consciousness, impaired attention, disorganized

care, especially with the growing aging population and increasing number of surgical interventions performed in elderly patients

Delirium has been recognized for centuries, yet it continues to be a poorly understood and frequently overlooked complication. The incidence of postoperative delirium varies widely depending on the type of surgery, patient population, and diagnostic criteria used. High-risk procedures such as cardiac surgery, orthopedic surgery (particularly hip fracture repair), and major abdominal surgery are commonly associated with higher rates of POD. Given its association with adverse outcomes, postoperative delirium has gained increasing attention as a quality indicator in surgical and anesthetic practice.

Definition and Classification

Delirium is defined as an acute disturbance in attention and awareness, accompanied by a change in cognition that cannot be better explained by a preexisting neurocognitive disorder. According to standard diagnostic criteria, delirium develops over a short period of time, tends to fluctuate during the course of the day, and is a direct consequence of an underlying medical condition, substance intoxication or withdrawal, or exposure to a toxin.

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Postoperative delirium can be classified into three subtypes based on psychomotor activity

- **Hyperactive delirium**: Characterized by agitation, restlessness, emotional lability, hallucinations, and aggressive behavior.
- **Hypoactive delirium**: Marked by lethargy, reduced motor activity, drowsiness, and apathy. This subtype is the most common and often underdiagnosed.
- **Mixed delirium**: Features alternating symptoms of both hyperactive and hypoactivedelirium

Epidemiology

The incidence of postoperative delirium ranges from 5% to 15% in the general surgical population and can exceed 50% in high-risk groups, such as elderly patients undergoing major orthopedic or cardiac surgery. In intensive care unit (ICU) settings, the prevalence may be even higher.

Pathophysiology

The pathophysiology of postoperative delirium is complex and multifactorial, involving an interplay of neuroinflammation, neurotransmitter imbalance, oxidative stress, cerebral hypoperfusion, and disruption of the blood–brainbarrierOne of the leading hypotheses is the neuroinflammatory model, which suggests that surgical trauma triggers a systemic inflammatory response. Pro-inflammatory cytokines can cross the blood–brain barrier or signal through neural pathways, leading to microglial activation and neuronal dysfunction.

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Other contributing mechanisms include metabolic derangements, hypoxia, anemia, electrolyte imbalances, and stress responses related to surgery and anesthesia

Outcomes and Prognosis

Postoperative delirium is associated with both short-term and long-term adverse outcomes. In the short term, it leads to increased length of hospital stay, higher rates of complications, and greater need for institutional care. Long-term consequences include persistent cognitive decline, reduced quality of life, and increased mortality.

Early recognition and effective management can improve outcomes, although some patients may experience prolonged cognitive impairment even after resolution of delirium.

Future Directions

Ongoing research aims to better understand the biological mechanisms underlying postoperative delirium and to identify reliable biomarkers for early detection. Advances in perioperative care, personalized risk prediction models, and novel preventive strategies may further reduce the incidence and impact of POD.

Refernces

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