



ADVANCES IN DELIRIUM MANAGEMENT: INTEGRATING PHARMACOLOGICAL AND NON-PHARMACOLOGICAL

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ABSTRACT

Delirium is an acute neuropsychiatric disorder characterized by disturbances in attention, cognition, and perception, commonly affecting hospitalized and critically ill patients. It is associated with increased morbidity, prolonged hospital stays, and higher mortality rates. The pathophysiology of delirium is complex and multifactorial, involving neurotransmitter imbalances, neuroinflammation, and metabolic disturbances. Early diagnosis using validated tools, such as the Confusion Assessment Method (CAM) and the 4AT test, is essential for improving outcomes. Management includes both non-pharmacological strategies, such as environmental modifications, cognitive stimulation, and early mobilization, as well as pharmacological treatments, including antipsychotics and dexmedetomidine in severe cases. Preventive measures, such as sleep hygiene and reorientation techniques, are crucial in reducing delirium incidence. A multidisciplinary approach integrating advanced diagnostic tools and personalized therapeutic strategies is recommended to enhance patient care. Future research should focus on novel biomarkers and artificial intelligence-assisted detection for early intervention.

KEYWORDS : Delirium, Acute Confusional State, Neurocognitive Disorders, Intensive Care, Antipsychotics

INTRODUCTION

Delirium is an acute confusional state characterized by disturbances in attention, cognition, and perception. It is particularly prevalent among hospitalized elderly patients and those in intensive care units (ICUs), where its incidence can reach up to 70% [1]. Delirium is associated with increased morbidity, prolonged hospital stays, and higher mortality rates [2]. The condition is often multifactorial, involving a complex interplay of predisposing factors, such as dementia and advanced age, and precipitating factors, including infections, medications, and metabolic imbalances [3].

Traditional management of delirium has focused on identifying and addressing underlying causes while employing pharmacological interventions, particularly antipsychotics, for symptomatic relief [4]. However, recent advances highlight the importance of non-pharmacological interventions, such as cognitive stimulation, early mobilization, and environmental modifications, in both prevention and treatment [5]. This article aims to integrate current evidence on pharmacological and non-pharmacological strategies to optimize delirium management and improve patient outcomes.

METHODS

A systematic review of the literature was conducted using four electronic databases: PubMed, Scopus, Embase, and Cochrane Library. Search terms included "delirium," "acute confusional state," "pharmacological management," "non-pharmacological interventions," and "cognitive dysfunction." Studies published between 2015 and 2025 were included. Articles were selected based on relevance, methodological quality, and contribution to the understanding of delirium management [6].

Inclusion criteria comprised randomized controlled trials (RCTs), systematic reviews, and cohort studies focusing on pharmacological and non-pharmacological management of delirium.

Exclusion criteria included case reports, editorials, and studies with insufficient methodological rigor. Data extraction focused on study design, sample size, intervention types, and primary outcomes related to delirium prevention and treatment. A final selection of 15 high-quality references was made to support this review.

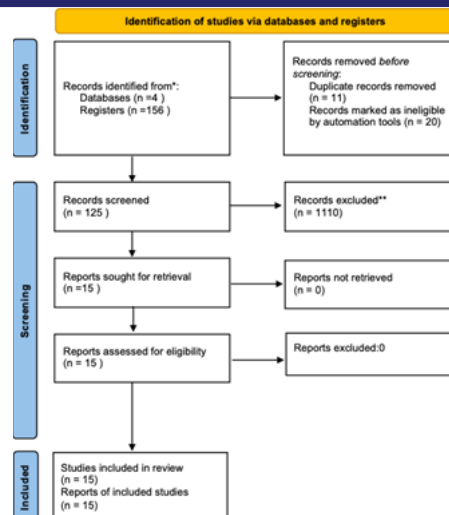


Figure 1. Prisma.

Epidemiology

Delirium is a common condition in hospitalized patients, with prevalence varying across different healthcare settings. It affects approximately 10-30% of general medical inpatients, 50% of post-surgical patients, and up to 80% of critically ill patients in intensive care units [7]. The incidence is higher in elderly individuals, particularly those with pre-existing cognitive impairment. Postoperative delirium is also frequent, occurring in 15-50% of elderly patients undergoing major surgeries [8]. Additionally, delirium is prevalent in palliative care settings, where it affects nearly 42% of patients. The occurrence of delirium is associated with a significant increase in mortality, with one-year mortality rates reaching 35-40% in some populations [9].

Risk Factors

Delirium arises from a combination of predisposing and precipitating factors. Predisposing factors include advanced age, dementia, previous history of delirium, and chronic illnesses such as cardiovascular disease, diabetes, and renal failure [10]. Precipitating factors involve acute medical conditions, including infections, electrolyte imbalances, dehydration, hypoxia, and polypharmacy [11]. Certain medications, particularly benzodiazepines, anticholinergics, and opioids, have been strongly linked to delirium onset [12]. Additional risk factors include prolonged

hospitalization, immobilization, sensory deprivation, and environmental disorientation [13] .

Environmental factors play a critical role in precipitating delirium, especially in hospitalized patients. Intensive care unit settings, with their high noise levels, frequent disruptions, and sleep disturbances, can exacerbate cognitive impairment. Poor lighting, lack of natural circadian rhythm regulation, and social isolation further contribute to the onset of delirium [14] . Moreover, unaddressed pain, malnutrition, and inadequate fluid intake can accelerate cognitive decline and increase the likelihood of delirium episodes [15] . Patients with a history of substance abuse, psychiatric disorders, or previous cognitive impairment are particularly vulnerable to developing delirium in stressful medical environments.

Diagnosis

The diagnosis of delirium is primarily clinical, based on patient history, symptom presentation, and validated assessment tools. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), defines delirium by disturbances in attention, cognition, and perception that develop over a short period and fluctuate throughout the day [7] . The Confusion Assessment Method (CAM) is the most widely used tool for bedside diagnosis, requiring the presence of acute onset, inattention, and either disorganized thinking or altered consciousness [8] .

Other diagnostic tools include the Intensive Care Delirium Screening Checklist (ICDSC) and the 4AT test, both of which have demonstrated high sensitivity and specificity in different clinical settings [9] . Laboratory tests and imaging studies, such as complete blood count, metabolic panels, urinalysis, and brain CT or MRI, are used to identify underlying causes [10] . Electroencephalography (EEG) may be beneficial in differentiating delirium from non-convulsive seizures or encephalopathies [11] . Given the fluctuating nature of delirium, repeated assessments are recommended to ensure accurate diagnosis and monitoring of disease progression [12] .

Emerging research suggests that integrating artificial intelligence-based cognitive assessments may improve early detection of delirium by analyzing patterns in speech, attention, and behavior [13] . Biomarkers such as inflammatory markers, neurofilament proteins, and neurotransmitter alterations are being investigated as potential objective measures for more precise delirium detection [14] . Early identification using predictive models and electronic health record alerts may enable faster intervention and improved patient outcomes [15] .

Treatment

The management of delirium involves a combination of pharmacological and non-pharmacological approaches aimed at addressing underlying causes, alleviating symptoms, and improving patient outcomes. The primary goal of treatment is to identify and correct any reversible causes, such as infections, metabolic disturbances, or medication side effects [15] .

Non-Pharmacological Approaches Non-pharmacological strategies play a critical role in both preventing and managing delirium. These interventions focus on optimizing the patient's environment and providing supportive care. Key components include:

- **Reorientation And Cognitive Support:** Ensuring patients have access to clocks, calendars, and familiar objects to minimize disorientation [14] .
- **Sleep Hygiene:** Reducing nighttime disturbances, avoiding unnecessary nighttime procedures, and using

non-pharmacological sleep aids [15] .

- **Early Mobilization:** Encouraging movement and physical therapy to prevent deconditioning and immobility-associated delirium [13] .
- **Sensory Enhancement:** Providing hearing aids and glasses to patients with sensory impairments to reduce confusion [14] .
- **Family Involvement:** Engaging family members in patient care to provide reassurance and familiar social interactions [15] .
- **Multisensory Stimulation:** Providing structured visual, auditory, and tactile stimulation to enhance cognitive engagement and prevent sensory deprivation.

Pharmacological Treatment While non-pharmacological interventions are preferred, pharmacological treatment is necessary for patients exhibiting severe agitation, distress, or those posing harm to themselves or others. Medications should be used cautiously and for the shortest duration possible. Commonly used agents include:

- **Antipsychotics:** Haloperidol and atypical antipsychotics such as risperidone and quetiapine are commonly used to manage agitation and hallucinations [12] .
- **Dexmedetomidine:** A sedative with potential benefits in ICU patients, shown to reduce the duration and severity of delirium [13] .
- **Avoidance of Benzodiazepines:** These drugs can exacerbate delirium and should be reserved only for cases involving alcohol or benzodiazepine withdrawal [14] .
- **Adjunctive Therapies:** Recent studies are exploring the use of melatonin, acetylcholinesterase inhibitors, and anti-inflammatory agents for potential delirium mitigation.

A multidisciplinary approach ensures comprehensive management, integrating medical, psychological, and rehabilitative strategies to minimize the long-term impact of delirium on cognitive and functional recovery.

CONCLUSION

Delirium remains a significant challenge in healthcare, particularly among hospitalized and critically ill patients. Its multifactorial nature necessitates a comprehensive approach to diagnosis, prevention, and management. Early identification using validated screening tools, along with prompt intervention targeting underlying causes, is crucial in improving patient outcomes. Non-pharmacological strategies such as environmental modifications, cognitive stimulation, and early mobilization should be prioritized, while pharmacological treatment should be reserved for severe cases requiring symptom control. Ongoing research into novel biomarkers and advanced diagnostic techniques may enhance early detection and personalized treatment approaches. A multidisciplinary strategy that includes physicians, nurses, therapists, and family involvement is essential in mitigating the impact of delirium on long-term cognitive and functional health. Future advancements in delirium management should focus on integrating technology and individualized therapeutic approaches to enhance patient care and outcomes.

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