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Through Different Eyes Sedation and Delirium Management in Intensive Care Unit Patients with Preexisting Visual Impairment

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Abstract

Preexisting visual impairment affects approximately 2.2 billion people globally and represents a significant but often overlooked consideration in the development of delirium in intensive care unit (ICU) settings. This commentary examines the current understanding of how visual impairment influences sedation requirements and delirium incidence in critically ill patients. Evidence from systematic reviews and observational studies suggests that sensory impairments—particularly when visual and hearing deficits co-occur—are associated with increased vulnerability to ICU delirium. Current evidence indicates that multicomponent, nonpharmacological interventions tailored specifically for visually impaired patients may reduce delirium incidence and duration, though direct evidence in this specific population remains limited. This review synthesizes available clinical findings, proposes recommendations for optimizing sedation protocols and delirium prevention strategies for this vulnerable population, and identifies critical gaps in current research that require further investigation.

Keywords: Critical care, delirium prevention, intensive care unit delirium, multicomponent intervention, nonpharmacological intervention, sedation management, sensory deprivation, visual impairment

Introduction

The intersection of preexisting visual impairment and critical illness presents unique challenges in intensive care medicine. Visual impairment affects approximately 2.2 billion people globally,[1] with prevalence increasing with age. As the global population ages, the number of visually impaired patients requiring critical care continues to rise. Intensive care unit (ICU) environments, characterized by constant light, noise, and frequent interventions, are inherently disorienting even for patients with intact sensory faculties. For those with preexisting visual impairment, these challenges are significantly magnified.

Delirium—an acute fluctuation in mental status characterized by inattention, disorganized thinking, and altered consciousness—affects 30%–80% of critically ill patients and is associated with increased mortality, prolonged hospitalization, and long-term cognitive impairment.[2] Evidence suggests that patients with preexisting sensory impairments, particularly when visual and hearing deficits co-occur, may experience delirium at higher rates than the general ICU population.

This commentary examines the current understanding of how visual impairment influences sedation requirements and delirium incidence in critically ill patients, synthesizing findings from available studies. It aims to provide recommendations for optimizing care in this unique patient population while acknowledging areas where evidence remains limited and expert opinion guides practice.

Current Understanding of Intensive Care Unit Delirium in Visually Impaired Patients

Epidemiology and Risk Assessment

The relationship between preexisting visual impairment and ICU delirium has gained increasing attention in recent years. A large multicenter study by Morandi and colleagues examining sensory impairment and delirium found that patients with delirium had a higher prevalence of visual impairment (24.2% vs 16.4%) compared to those without delirium in univariate analysis.[4] However, it is important to note that in multivariable analysis, visual impairment alone was not independently associated with delirium (OR 0.8; P=0.27). Rather, the study found that bi-sensory impairment—the combination of both visual and hearing deficits—was independently associated with increased delirium risk (OR 1.4; P=0.02).[4]This finding suggests that the co-occurrence of multiple sensory deficits may be more clinically significant than isolated visual impairment.

A systematic review and meta-analysis of risk factors for incident delirium among older hospitalized patients identified visual impairment as a significant risk factor (OR1.89; 95% CI 1.03–3.47).[5] Although statistically significant, this effect size is modest relative to other established risk factors, such as dementia (OR 6.62 in the same meta-analysis), underscoring the need to consider visual impairment within the broader context of delirium risk stratification.

Several proposed mechanisms may explain the relationship between sensory
impairment and delirium:

1. Enhanced sensory deprivation in the ICU environment
2. Impaired environmental cuing and circadian entrainment
3. Increased disorientation and cognitive load
4.Altered perception of environmental threats leading to heightened stress responses

While some authors have hypothesized that delirium phenotype may differ in visually impaired patients, with potential increased prevalence of hypoactive delirium compared to hyperactive or mixed subtypes,[6] specific data examining delirium phenotypes in visually impaired populations are lacking. This represents an important area for future research, as hypoactive delirium may lead to delayed recognition and treatment. Current delirium assessment tools such as the Confusion Assessment Method for the ICU (CAM-ICU) have been validated for use in critically ill patients,[7,8] though their specific performance in patients with sensory impairments requires further study.

Pharmacokinetic and Pharmacodynamic Considerations

Limited empirical evidence exists regarding altered pharmacokinetics and pharmacodynamics of commonly used ICU sedatives in visually impaired patients. **The following considerations remain largely theoretical and require validation through dedicated research:**

1. Chronic alterations in neurotransmitter systems, particularly gamma-aminobutyric acid and glutamate, in response to long-standing visual impair men

2. Neuroplastic changes in brain regions involved in both visual processing and consciousness

3.Potential differences in drug receptor density or sensitivity in visually impaired individuals

These hypothetical mechanisms suggest that standard sedation protocols may need adjustment for visually impaired patients to prevent oversedation and its associated complications. However, in the absence of empirical data, any such modifications should be guided by careful clinical assessment and individualized patient response rather than protocol-driven dose adjustments.

Evidence-Based Interventions

Sedation Management

Current evidence-based sedation management in ICU patients follows established guidelines, particularly the PADIS (Pain, Agitation/sedation, Delirium, Immobility, and Sleep disruption) guidelines.[9] For visually impaired patients, the following modifications to standard protocols may be considered, though direct evidence for these specific recommendations is limited:

1. More frequent sedation assessment to detect subtle changes in mental status
2. Enhanced verbal communication during awakening trials
3. Use of processed electroencephalography monitoring when available
4. Consideration of reduced initial dosing based on clinical assessment

The CAM-ICU has demonstrated excellent reliability and validity when used by nurses and physicians to identify delirium in intensive care unit patients,[7,8] though specific validation in visually impaired populations is limited.

Delirium Prevention Strategies

Evidence supports multicomponent, nonpharmacological interventions for delirium prevention in general ICU populations.[5] For visually impaired patients, enhanced interventions may include:

1. Regular verbal orientation by staff
2. Provision of tactile timepieces and calendars
3. Enhanced descriptive communication of surroundings and procedures
4. Regular use of patients' personal assistive devices (glasses and magnifiers)
5. Optimization of ambient lighting in accordance with day–night cycles
6. Audio description of the environment and activities

Pharmacological Considerations

Pharmacological management of delirium in ICU patients remains challenging. Evidence from large randomized trials, including the MIND-USA trial, suggests that antipsychotics may not be effective for delirium treatment in general ICU populations.[15] A comprehensive network meta-analysis found that multicomponent strategies were the most effective non-pharmacological interventions in reducing ICU delirium incidence.[16]

For visually impaired patients, the following pharmacological considerations represent expert opinion extrapolated from studies in general ICU populations, as direct evidence in visually impaired cohorts is lacking:

Dexmedetomidine

Studies in general ICU populations have examined early sedation strategies with dexmedetomidine.[17] While some data suggest potential benefits for reducing delirium, the specific applicability to visually impaired patients has not been studied.

Melatonin

Melatonin supplementation has been studied for circadian rhythm support in general ICU populations.[18] Its potential role in patients with complete blindness—who may have disrupted endogenous melatonin secretion due to absent light perception—remains theoretical and requires specific investigation.

Emerging Concepts and Future Directions

Personalized Risk Assessment

Future approaches to delirium risk assessment in visually impaired patients should incorporate:

1. Specific risk stratification tools accounting for degree and type of visual impairment
2. Assessment of bi-sensory impairment, given emerging evidence of its independent association with delirium risk
3. Integration of visual function assessment into existing delirium risk models such as PRE-DELIRIC.[25]
4. Consideration of etiology of visual impairment (central vs peripheral, acute vs chronic)

Critical Research Gaps

Several key questions remain unanswered in this area:

1. Whether isolated visual impairment represents an independent risk factor for ICU delirium, or whether the observed associations are primarily driven by bi-sensory impairment or confounding factors
2. Optimal sedation targets and monitoring strategies in visually impaired patients
3. Validation of existing delirium assessment tools in visually impaired populations

4. Delirium phenotype distribution in visually impaired patients
5. Efficacy of targeted pharmacological interventions (dexmedetomidine, melatonin) in this specific population

Practical Recommendations

Based on available evidence and expert opinion, the following recommendations are proposed for managing sedation and preventing delirium in visually impaired ICU patients. Recommendations are categorized by strength of supporting evidence:

1. **Comprehensive sensory assessment upon ICU admission** (Evidence-based): Document baseline visual acuity, use of corrective devices, and concurrent hearing impairment. Patients with bi-sensory impairment warrant heightened delirium surveillance.
2. **Light sedation protocols** (Evidence-based): Implement the ABCDEF bundle with particular attention to avoiding oversedation. Use validated sedation scales with enhanced frequency of assessment.

3. **Multimodal delirium prevention** (Evidence-based with population-specific modifications): Implement multicomponent nonpharmacological strategies with enhanced auditory and tactile orientation cues, circadian rhythm optimization through controlled lighting and sound adjustment, early mobility programs with enhanced safety considerations, and family engagement with familiar voice exposure.
4. **Pharmacological prophylaxis** (Expert opinion—limited direct evidence): Low-dose dexmedetomidine or melatonin may be considered for high-risk patients, though direct evidence in visually impaired populations is lacking.
5. **Staff education** (Expert opinion): Training regarding the unique needs of visually impaired patients should be integrated into ICU education programs.
6. **Post-ICU follow-up** (Expert opinion): Address the potential interaction between preexisting visual impairment and post-intensive care syndrome.

Conclusion

Preexisting visual impairment represents an important consideration in the care of critically ill patients, though current evidence suggests that bi-sensory impairment (combined visual and hearing deficits) may be a stronger independent risk factor for delirium than isolated visual impairment. Available evidence supports multicomponent nonpharmacological interventions for delirium prevention, with adaptations for visually impaired patients representing reasonable extensions of proven strategies, albeit with limited direct evidence.

As the population ages and the prevalence of visual impairment increases, critical care clinicians must develop greater awareness and expertise in managing these complex patients. Future research should focus on clarifying the independent contribution of visual impairment to delirium risk, validating assessment tools in sensory-impaired populations, and evaluating targeted interventions. By viewing the critical care environment "through different eyes," clinicians can develop more personalized and effective approaches to sedation and delirium management in this distinctive patient population.

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References

1. 1. World Health Organization, World Report on Vision, Geneva. *World Health Organization.* 2019.
2. Ely EW, Gautam S, Margolin R, et al. The impact of delirium in the intensive care unit on hospital length of stay. *Intensive Care Med*. 2001;(27):1892-1900.
3. Salluh JI, Wang H, Schneider EB, et al. Outcome of delirium in critically ill patients: systematic review and meta-analysis. *BMJ*. 2015;350:h2538.
4. Morandi A, Di Santo SG, Cherubini A, et al. Visual and hearing impairment are associated with delirium in hospitalized patients: results of a multisite prevalence study. *J Am Med Dir Assoc*. 2021;(22):1162-1169.
5. Ahmed S, Leurent B, Sampson EL. Risk factors for incident delirium among older people in acute hospital medical units: a systematic review and meta-analysis. *Age Ageing*. 2014;(43):326-33.
6. 6. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. *Lancet*. 2014;(383):911-22.
7. Ely EW, Margolin R, Francis J, et al. Evaluation of delirium in critically ill patients: validation of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). *Crit Care Med*. 2001;(29):1370-9.
8. 8. Ely EW, Inouye SK, Bernard GR, et al. Delirium in mechanically ventilated patients: validity and reliability of the confusion assessment method for the intensive care unit (CAM-ICU). *JAMA*. 2001;(286):2703-10.
9. Devlin JW, Skrobik Y, Gélinas C, et al. Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Crit Care Med*. 2018;(46):e825-e873.
10. Balas MC, Vasilevskis EE, Olsen KM, et al. Effectiveness and safety of the awakening and breathing coordination, delirium monitoring/management, and early exercise/mobility bundle. *Crit Care Med*. 2014;(42):1024-36.
11. Balas MC, Burke WJ, Gannon D, et al. Implementing the awakening and breathing coordination, delirium monitoring/management, and early exercise/mobility bundle into everyday care. *Crit Care Med*. 2013;(41):S116-27.

12. Marra A, Ely EW, Pandharipande PP, et al.The ABCDEF bundle in critical care. *Crit Care Clin*. 2017;(33):225-43.
13. Pun BT, Balas MC, Barnes-Daly MA, et al. Caring for critically ill patients with the ABCDEF bundle: results of the ICU liberation collaborative in over 15,000 adults. *Crit Care Med*. 2019;(47):3-14.
14. Rood P, Ista E, van Oosten S, Spronk PE, van der Voort PHJ. The effect of the ABCDE/ABCDEF bundle on delirium, functional outcomes, and quality of life in critically ill patients: a systematic review and meta-analysis. *Intensive Crit Care Nurs*. 2022;(71):103247.
15. Girard TD, Exline MC, Carson SS, et al. Haloperidol and ziprasidone for treatment of delirium in critical illness. *N Engl J Med*. 2018;(379):2506-2516.
16. Ng KT, Teoh WY, Khor WX, et al. Comparative effectiveness of non-pharmacological interventions for preventing delirium in critically ill adults: a systematic review and network meta-analysis. *Intensive Crit Care Nurs*. 2022;(71):103252.
17. Shehabi Y, Bellomo R, Reade MC, et al. Early intensive care sedation predicts long-term mortality in ventilated critically ill patients. *Am J Respir Crit Care Med*. 2012;(186):724-31.
18. Bourne RS, Mills GH, Minelli C. Melatonin therapy to improve nocturnal sleep in critically ill patients: encouraging results from a small randomised controlled trial. *Crit Care*. 2008;(12):R52.
19. Vasilevskis EE, Ely EW, Speroff T, et al. Reducing iatrogenic risks: ICU-acquired delirium and weakness—crossing the quality chasm. *Chest*. 2010;(138):1224-33.
20. Gusmao-Flores D, Salluh JI, Chalhub RA, et al. The confusion assessment method for the intensive care unit (CAM-ICU) and intensive care delirium screening checklist (ICDSC) for the diagnosis of delirium: a systematic review and meta-analysis of clinical studies. *Crit Care*. 2012;(16):R115.
21. Pandharipande PP, Girard TD, Jackson JC, et al. Long-term cognitive impairment after critical illness. *N Engl J Med*. 2013;(369):1306-16.
22. Brummel NE, Jackson JC, Pandharipande PP, et al. Delirium in the ICU and subsequent long-term disability among survivors of mechanical ventilation. *Crit Care Med*. 2014;(42):369-77.
23. Chow WB, Rosenthal RA, Merkow RP, et al. Optimal preoperative assessment of the geriatric surgical patient: a best practices guideline from the American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society. *J Am Coll Surg*. 2012;(215):453-66.
24. Rosenthal Genser L, Bellier A, Turc J, et al. Prevalence of sensory impairments and their association with delirium incidence in older surgical patients: a systematic review and meta-analysis. *Age Ageing.* 2022;(51):afac229.
25. Van den Boogaard M, Pickkers P, Slooter AJ, et al. Development and validation of PRE-DELIRIC (PREdiction of DELIRium in ICu patients) delirium prediction model for intensive care patients: observational multicentre study. *BMJ*. 2012;(344):e420.
26. Lin RY, Heacock LC, Fogel JF. Drug-induced, dementia-associated and non-dementia, non-drug delirium hospitalizations in the United States, 1998-2005: an analysis of the national inpatient sample. *Drugs Aging.* 2010;(27):51-61.
27. Boncyk CS, Weinger MB, Posner KL, et al. Delirium in the elderly perioperative patient: a review of the ASA closed claims project database. *Perioper Med*. 2014;3:12.
28. Oh ES, Fong TG, Hshieh TT, et al. Delirium in older persons: advances in diagnosis and treatment. *JAMA*. 2017;(318):1161-74.