Promoting sleep and other simple, non-pharmacological interventions for preventing and treating ICU Delirium: case report

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Short Report

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Abstract

Delirium is common among critically ill patients and it prolongs the length of ICU and hospital stays and is associated with worse outcomes, including cognitive impairment and increased mortality. No medications have been shown to have a consistent therapeutic benefit. Delirium is a form of brain dysfunction characterized by the acute onset of fluctuating mental status, inattention, disorganized thinking, and altered level of consciousness. These features are also seen in states of acute sleep deprivation. It is believed that the state of delirium contributes to disrupted sleep just as sleep deprivation is considered a modifiable risk factor for delirium. Improving sleep conditions and other nonpharmacologic interventions to promote sleep may be an underused approach to preventing and treating delirium in critical illness.

Case Report

A fifty-year-old man with a past medical history of hypertension and obesity presented to the emergency department with cough, muscle aches, sore throat, and fever, and tested positive for SARS CoV-2. Two days after symptoms began, he was admitted to the intensive care unit (ICU) and intubated for acute hypoxemic respiratory failure and acute respiratory distress syndrome (ARDS) from COVID-19 pneumonia. He was extubated three weeks later.

After extubation, the patient was agitated. Vital signs were within normal limits except for occasional episodes of hypertension and tachycardia. The physical exam was notable for diaphoresis and frequent displays of agitated delirium without focal neurologic deficit.

We suspected medication withdrawal, as he had been receiving high dose infusions of dexmedetomidine and hydromorphone while intubated. He was given diazepam and hydromorphone boluses and restarted on dexmedetomidine and hydromorphone infusions. A clonidine taper was initiated to facilitate weaning off dexmedetomidine. A fentanyl patch was applied, and hydromorphone infusion was discontinued within 24 hours. Antipsychotic medications were added. Despite these pharmacologic interventions, the patient remained persistently agitated and paranoid.

Discussion

Delirium is a form of brain dysfunction characterized by the acute onset of fluctuating mental status, inattention, disorganized thinking, and altered level of consciousness. It can be hyperactive, hypoactive, or mixed. These features are also seen in states of acute sleep deprivation. It is believed that the state of delirium contributes to disrupted sleep just as sleep deprivation is considered a modifiable risk factor for delirium.

The Confusion Assessment Method (CAM) and the CAM-Intensive Care Unit (CAM-ICU) are validated tools to help establish the diagnosis of delirium. Another commonly used and validated scoring system is the Intensive Care Delirium Screening Checklist (ICDSC). The consistent utilization of these screening tools

and heightened awareness by clinicians increase the likelihood of early detection of delirium. Prompt diagnosis leads to early identification of possible etiologies and rectification where possible, and in turn, reduces adverse events associated with delirium.

Delirium prolongs the length of ICU and hospital stays and is associated with worse outcomes, including cognitive impairment and increased mortality. It is common for ICU patients to develop delirium, with the highest incidence (up to 70%) seen in elderly patients. Various medications have been evaluated in the prevention of delirium, but none have been shown to have consistent benefit. Medications, such as typical and atypical antipsychotics, are often used to treat agitation associated with delirium. Although use of sedatives or antipsychotics may be warranted if patients are at risk of harm to themselves or others, no studies have demonstrated a definitive benefit over placebo in terms of delirium-free days, physical restraints use, length of stay, or other adverse effects associated with delirium. Recognizing an important limitation to the available data being that studies predominantly included patients with hypoactive delirium, there is no known effective pharmacologic treatment for delirium. Instead, we aim to prevent or diminish delirium by addressing the myriad suspected contributors to delirium, such as inadequately treated pain, acute illness, metabolic derangements, constipation, altered sensorium (due to lack of hearing aids or glasses), deliriogenic medications, immobility, restraints, isolation, environmental noise, and disruption of sleep/wake cycles. Among these, some important and inexpensive under-utilized tools are an eye mask and earplugs to help facilitate sleep.

Clinical Course

Over the four days post-extubation, our patient consistently scored 0 to +2 on the Richmond Agitation-Sedation Scale (RASS) and was positive for delirium based on the CAM-ICU. The ICU clinicians caring for him realized that he had not slept for three nights. On the fourth night post-extubation, the nurses and doctors caring for him offered verbal redirection, reassured him that he was safe, and offered earplugs and an eye mask to help minimize noise and light to promote sleep. Despite remaining disoriented, he wore the earplugs and eye mask and slept through the night. The next morning, the patient was calmer and was able to reply appropriately to simple yes/no questions. He still tested positive for delirium based on CAM-ICU, but his RASS had decreased to -1 which allowed dexmedetomidine infusion to be discontinued.

The following evening (five days post-extubation), the team forgot to apply the earplugs and eye mask. The patient did not sleep and returned to a state of agitated delirium the next morning. That night, we applied the ear plugs and eye mask again, and he awoke calm, lucid, and appropriate, with RASS of zero and negative CAM-ICU.

Our patient was cared for in a large, shared space reconfigured into an ICU during the COVID-19 surge. When he became lucid, he reported experiencing frightening delusions – he thought other patients were his family members tied down on beds being harmed by the ICU staff. The earplugs and eye mask may have blocked visual and auditory stimuli and helped to diminish delusions, in addition to promoting

sleep. His case illustrates a correlation between sleep deprivation and delirium and the benefit of a low-cost, non-pharmacological approach to assist with sleep.

Clinical Pearls

- 1. Antipsychotics have no demonstrated efficacy in mitigating delirium. Additionally, they bring potential adverse effects, including arrhythmia and prolonged QTc, necessitating monitoring with electrocardiogram, and potential extrapyramidal reactions.
- 2. Small studies in hospitalized patients have shown that improving sleep by minimizing nighttime disruption, noise, and light exposure and using eye masks and earplugs is associated with reduced episodes of delirium.
- 3. Given the prevalence and harm associated with ICU delirium and the potential benefits from improving sleep conditions, nonpharmacologic approaches to promoting sleep hygiene should be considered part of the toolkit for prevention and treatment of ICU delirium in non-intubated critically ill patients.

Non-pharmacological interventions to prevent and treat ICU delirium	
Categories	Examples
Reorientation	Orient patient to time, place, and situation. Redirect, normalize fear, assure patient they are safe and being cared for and discuss their important people, places, pets to promote sense of self and connection. Involve family in their care.
Cognition	Engage in conversations. Books. Puzzles.
Mobility	Sitting up in bed/chair. Early ambulation. Physical Therapy.
Sensorium	Glasses. Hearing aids.
Sleep	Eye mask. Earplugs. Avoid lab draws and other disruptions at night. Minimize light exposure at night.

Declarations

Ethical Approval and Consent to participate

Not applicable

Consent for publication

The case is deidentified and has no individual details, images, or videos. Additionally, the patient whose case formed the basis of this brief report provided written and verbal permission to publish.

Availability of supporting data

Not applicable

Competing interests

Not applicable

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Authors' contributions

STC and LKR wrote the manuscript and chose the selected references, LKR offered oversight and edits, STC prepared the table with input from LKR. MP provided expert guidance on the discussion and reference selection related to sleep medicine.

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Not applicable

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