

Sedation and delirium in the intensive care unit

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Abstract

Sedation is an important aspect of intensive care practice. Strategies for providing sedation, methods for assessing depth of sedation and various pharmacological options are discussed in this article. Delirium is common in the intensive care unit and is important to recognize because of the association with increases in both morbidity and mortality. Various strategies exist for identifying and managing delirium. This article examines how delirium can be diagnosed and identifies both pharmacological and non-pharmacological treatments.

Keywords Agitation; analgesia; delirium; hypnosis; intensive care; sedation; sedation scores

Royal College of Anaesthetists CPD Matrix: 1A02, 2C05, 3A13

Introduction

Sedation is commonly used in the intensive care unit for a number of reasons; to alleviate pain and distress, to permit tolerance of the endotracheal tube, to facilitate mechanical ventilation and invasive procedures and to reduce physiological stress. Traditionally patients were deeply sedated often in combination with neuromuscular blockade for the above purposes; however recent evidence is emerging that light sedation is beneficial for patients in terms of reduced morbidity and reduced lengths of ventilation and intensive care stay.

Over and under sedation

The optimal goal is to enable a patient to be comfortable, orientated, pain free and able to cooperate with interventions such as physiotherapy. Light sedation is the ideal but it is a careful balancing act aimed at reducing the adverse consequences of over and under sedation (Figure 1).

Light versus deep sedation

The recent Pain, Agitation and Delirium guidelines¹ have recommended targeting a light level of sedation when not clinically contraindicated. The rationale for this is to reduce the following: duration of mechanical ventilation and intensive care stay, complications of mechanical ventilation (such as ventilator-

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Learning objectives

After reading this article, you should be able to:

- explain the need for sedation on the intensive care unit
- discuss the use of sedation scores and targets of sedation
- justify the drugs used to provide sedation
- define the delirium subtypes
- describe methods to identify delirium
- compare drugs and methods used to treat delirium

associated pneumonia, barotrauma and airway trauma) and delirium. Targeting light sedation should be the default strategy when commencing sedation for intensive care patients. Not all patients are suitable for light sedation: examples of those groups include patients with intracranial pathology with elevated intracranial pressure, those receiving therapeutic hypothermia and those patients with severe acute lung injury to optimize mechanical ventilation.

Measuring depth of sedation

Numerous scoring tools have been developed to help assess sedation depth and facilitate titration of sedative medication to achieve a desired sedation target. Among the most commonly used are the Richmond Agitation and Sedation Scale (RASS), the Riker Sedation Agitation Scale (SAS) and the Ramsay scale. The RASS and the SAS are the most validated and reliable tools in assessing depth of sedation.¹ The RASS has been shown to be quick (taking 1–2 minutes to complete) and easy to reproduce (see Table 1). The particular scoring system used is less important than ensuring adherence to the use of the scoring system to ensure the patient achieves the desired sedation target and unwanted side effects or adverse events are reduced. A sedation score of 0 to –2 corresponds to light sedation when using the RASS, with more negative scores indicating deep sedation and positive scores indicating agitated patients. When neuromuscular blockade is utilized, clinical scoring systems cannot be used; objective measures to assess sedation such as bispectral index or auditory evoked potentials may be of use in this situation.

Sedation protocols

Sedation protocols provide a framework that allows titration of sedative medication based on the sedation score to achieve a desired or target sedation level. Protocols may utilize a bolus sedation strategy initially prior to using infusions if the frequency of boluses per hour exceeds a set amount. Bolus sedation strategy allows better titration of sedation but requires increased nursing workload compared to the use of infusions. Some studies have shown that sedation protocols decrease the duration of mechanical ventilation, intensive care stay and hospital stay.^{2–4}

Targeting appropriate sedation

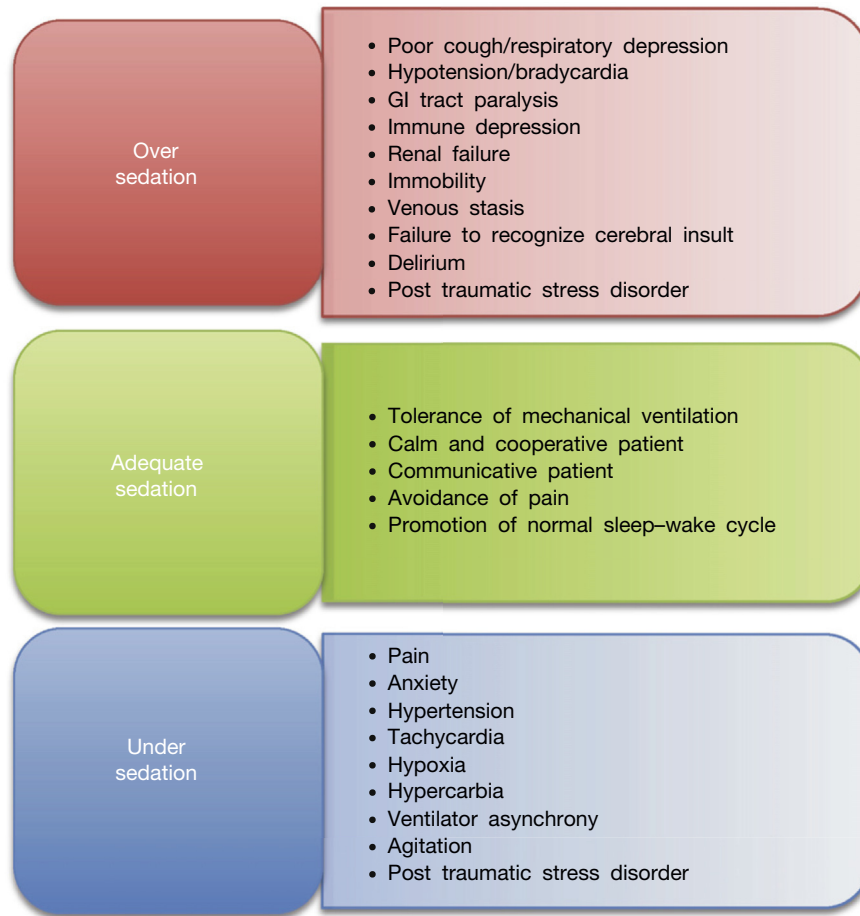


Figure 1

Methods of targeting light sedation

Evidence suggests that deeper sedation can lead to longer durations of mechanical ventilation and intensive care stay.^{2,5-7} There are two main methods of minimizing sedation:

- protocolized sedation that targets a light level of sedation
- daily sedation interruptions (DSIs).

Protocolized sedation involves using sedation protocols to target a light level of sedation. The target level of sedation is usually set by the medical staff twice per 24 hours and the bedside nurse titrates the medication according to the protocol and desired sedation depth. A DSI is the process of cessation or reduction of sedation to wake the patient prior to restarting sedation. Both strategies have similar effects of minimizing accumulation of sedation with the aim of improving patient outcome and reducing duration of mechanical ventilation and intensive care length of stay. There have been concerns with patient comfort and safety when using DSI, and in addition there is an increase in nursing workload. There is no evidence of superiority for one strategy over the other. The SLEAP study⁸ also showed that when DSI was used in combination with protocolized sedation there was no additional benefit to using protocolized sedation alone.

Pharmacological sedation

Various drugs are used for pharmacological sedation in the intensive care unit. They are broadly classified into three main groups:

1. Analgesic drugs – primarily opioids and ketamine.
2. Hypnotic drugs – propofol and benzodiazepines.
3. Alpha-2 agonists – clonidine and dexmedetomidine.

The sedation regimen an intensive care unit uses is generally based on individual and institutional preference and cost factors and there is no evidence to suggest superiority of one particular regimen. The most commonly used regimens are an opioid in combination with either propofol or a benzodiazepine. Analgesia first sedation is an attractive concept whereby the sedation needs are met by an opioid alone, with a second agent such as a hypnotic being added if required. This leads to a prioritization of the treatment of pain, a reduction of the co-administered hypnotic agents and thus a reduction of the attendant side effects. Studies by Strøm,⁹ Breen¹⁰ and Muellejans¹¹ indicate a reduced ICU length of stay when an analgesia-based sedation protocol is used.

Propofol and benzodiazepines are commonly used hypnotic agents; benzodiazepines are cheap and are familiar amongst many intensive care units. There are concerns, however, over the

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