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Editorial

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Optimization of Analgesia and Sedation

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Editorial

Ensuring patient comfort and safety may be a universal goal for critical care practitioners. Patients undergoing mechanical ventilation experience significant stress superimposed on their acute medical problem, starting from anxiety about their surroundings and condition to distress with potential pain from necessary medical care and procedures. Non-pharmacologic therapies like comfortable positioning in bed and verbal reassurance are reasonable initial considerations, but a requirement for sedatives and analgesics to market tolerance to the medical care unit (ICU) environment is usually the rule. Sedation needs vary widely in mechanically ventilated patients.

The risk for untreated pain or agitation may be a primary concern. Most mechanically ventilated patients experience a point of pain even within the absence of surgical incisions or trauma. Accordingly, it's critical for clinicians to direct initial attention toward analgesia once they administer 'sedation'. Untreated pain may cause many adverse effects, including increased endogenous catecholamine activity, myocardial ischemia, hypercoagulability, hyper metabolic states, sleep deprivation, anxiety, and delirium; treating this pain has been shown to ameliorate a number of these effects. Untreated agitation, particularly within the delirious patient, may end in similar problems, including patient self-injury via removal of life-sustaining devices.

Patient-targeted sedation protocols

Patient-targeted sedation protocols implement two main features: a structured approach to the assessment of patient pain and distress, including an algorithm that directs drug escalation and de-escalation supported the assessments.

Analgesic and sedative administration (irrespective of route and type) guided to make sure patient safety and designed to market tolerance to an uncomfortable environment and altered state of health may result in improved outcomes. Seemingly, this result stems from a more rapid return to an awake state, but other factors could also be at play, including avoidance of protracted immobility, ileus, delirium, and dangerous agitation. Studies to explore these mechanisms may help to guide subsequent generation of drug selection and administration strategies.

Daily interruption of sedative infusions

If the first goal is to realize the earliest awakening possible, then an alternate sedation protocol strategy which will be applied is daily interruption of sedative infusions (DIS). This strategy employs an identical goal of sedative and analgesic titration to an optimal depth of sedation dictated by physicians or nursing staff, or both. In contrast to 'patient-targeted sedation protocols', no formal algorithm has been established for drug escalation. However, the danger for excessive sedation is minimized by a daily interruption of both sedative and analgesic infusions until the patient awakens or exhibits distress that mandates resumed drug administration.

The practice of DIS generates more complex discussion than patient-titrated sedation protocols. Both sedative and analgesic agents should be interrupted once daily, unless there's evidence for ongoing patient distress, reasonable certainty that there's ongoing pain, or utilization of neuromuscular blockade. Once the drugs are interrupted, the ICU team must be vigilant for evidence of patient distress, which can manifest as overt physical agitation, isolated hemodynamic lability (hypertension or tachycardia), or ventilator asynchrony.

Finally, concern for the interplay between sedative interruption and withdrawal syndromes is understandable. Alcohol and other drug use disorders (AOD) affect 9.4% of the American population, and therefore the prevalence of those disorders in ICUs ranges from 9% to 39%. Studies have demonstrated that selected patients with AOD have a greater likelihood of being admitted to an ICU, increased risks for requiring mechanical ventilation and developing sepsis, septic shock, and acute lung injury, and increased hospital mortality.

Continuous versus intermittent sedative administration

Given concern that continuous sedative infusions carry such heightened risk for excessive sedation, guidelines have postulated that intermittent bolus techniques utilizing benzodiazepines could be the same (or superior) sedation strategy, even with daily interruption of sedative infusions. The comparison of those two strategies was studied in two academic centers' MICUs in an open label trial of 132 patients requiring quite 48 hours of mechanical ventilation and moderate to high levels of sedation. Patients were randomly assigned to receive lorazepam by intermittent bolus administration or continuous infusions of propofol. In both groups, patients had sedation titrated to realize a target Ramsay Sedation Scale score of two to three assessed every 2 hours.

Implementing a sedation protocol

Despite the success of sedation protocols outlined above, there's still surprisingly low implementation of sedation scoring systems and sedation protocols generally practice. Recent surveys of sedation practice patterns in Canada, the USA, and Denmark documented that formalized sedation scoring systems/assessment tools are present in ≤ 50% of critical care units, with sedation protocols being utilized in ≤ 33%.

Some of the reluctance to adopt sedation protocols may stem from the absence of large-scale, multicenter, randomized trials within the field, and from institutional and individual bias regarding sedation scales and agents employed. However, we believe that existing data support certain conclusions. Successful sedation protocol implementation requires three factors: frequent assessment of sedation and analgesia employing a reproducible scale; combination therapy

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coupling sedatives and opioids with dosing adjustments guided by the scale; and, most significantly, careful communication between team members, with particular recognition that the bedside nurse must be empowered to pair assessments with drug manipulation.

Finally, and most significantly, all of the sedation protocols that have exhibited success have transferred the responsibility for drug manipulation decisions to the bedside nurse. Although a consistent goal should be set through physician and nurse communication at the beginning of the day(at a minimum), the variable response to drug administration and withdrawal mandates an attendant clinician with the power to reply in rapid manner–the bedside nurse.

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