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MODERN APPROACH TO ICU SEDATION

СУЧАСНИЙ ПІДХІД ДО СЕДАЦІЇ У ВАІТ

Krishtafor D. A.
Candidate of Medical Sciences, Assistant Professor at the Department of Anesthesiology, Intensive Care and Emergency Medicine, Faculty of Postgraduate Education, Dnipro State Medical University Dnipro, Ukraine

Кріштафор Д. А.
кандидат медичних наук, асистент кафедри анестезіології, інтенсивної терапії та медицини невідкладних станів ФПО Дніпровський державний медичний університет м. Дніпро, Україна

Kravets O. V.
Doctor of Medical Sciences, Professor, Head of the Department of Anesthesiology, Intensive Care and Emergency Medicine, Faculty of Postgraduate Education Dnipro State Medical University Dnipro, Ukraine

Кравець О. В.
доктор медичних наук, професор, завідуюча кафедри анестезіології, інтенсивної терапії та медицини невідкладних станів ФПО Дніпровський державний медичний університет м. Дніпро, Україна

Stanin D. M.
Candidate of Medical Sciences, Associate Professor at the Department of Anesthesiology, Intensive Care and Emergency Medicine, Faculty of Postgraduate Education, Dnipro State Medical University Dnipro, Ukraine

Станін Д. М.
кандидат медичних наук, доцент кафедри анестезіології, інтенсивної терапії та медицини невідкладних станів ФПО Дніпровський державний медичний університет м. Дніпро, Україна

Sedation is used in 85% of patients in the intensive care units (ICU). Its purpose is to reduce discomfort and synchronize the patient with the respirator during mechanical ventilation (MV). However, achieving the desired level of sedation with minimal side effects remains a challenge. E. Wesley Ely et al. (2003) showed that patients requiring mechanical ventilation spend 1/3 of their time in a state of deep sedation (RASS (Richmond Agitation & Sedation Scale) score −5/−4), 1/3 of their time in moderate-to-light sedation (RASS −3 to −1), and only 1/3 of their time in a target alert and calm state (RASS 0/–1) [1].

Excessive sedation is very common in world ICU practice. The causes of excessive sedation are inappropriate use of scores (or using inappropriate tools for scoring), incorrect assessment of the need for medications,

excessive medical staff workload and lack of multidisciplinary rounds. Its consequences are prolonged MV, impaired wound healing, intestinal paresis, propofol-related infusion syndrome, difficulty in assessing neurological status. On the other hand, insufficient sedation carries significant risks of trauma, respirator asynchrony, hemodynamic instability, and elevation of intracranial pressure (ICP) [2].

Dexmedetomidine, propofol, and midazolam are most commonly used for sedation in the ICU nowadays. They are well controlled and allow achieving the target sedation level with minimal side effects. Contraindications to use are: for dexmedetomidine – hemodynamic instability, for propofol – allergy to soy and peanuts, for midazolam – severe respiratory failure. If those drugs are not available (ie in third world countries), sedation can also be performed with ketamine. It preserves peristalsis and breathing, reduces the need for vasopressors, reduces the risk of cognitive impairment, and has an analgesic effect. However, ketamine is contraindicated in eclampsia and preeclampsia, craniocerebral injuries and strokes, severe cardiovascular diseases, and may have severe side effects, such as hallucinations, nightmares, psychomotor agitation, hypersalivation, laryngospasm, and vomiting [3].

Historically, sodium thiopental and sodium oxybutyrate (more commonly mentioned in international literature as gammahydroxybutyrate, GHB) have also been used for sedation in the ICU. However, they have poor controllability and unpredictable duration of action when used long-term. Sodium thiopental is currently recommended only for refractory status epilepticus, and GHB has been withdrawn from global practice for sedation in the ICU since early 2000s due to its prolonged and unpredictable duration of action [4].

There is also a relatively new concept of "*analgesia-based sedation*", the basis of which are opioids. Most often used for this are remifentanil (3–12 μg / kg / h) and fentanyl (0.7–10 μg / kg / h). High doses of opioids can achieve deep sedation, but carry the risk of developing tolerance, dependence, hyperalgesia and withdrawal syndrome. Opioids should also be used with caution if it is necessary to maintain spontaneous breathing. Propofol or midazolam are also often combined with opioids (fentanyl, remifentanil) to provide sedation and analgesia. The doses are no different from those used alone [4].

Ensuring patient comfort in the ICU also includes non-pharmacological measures, such as constant communication with the patient both by staff and family, physiotherapy, and meeting basic needs for water and food. The issue of physical immobilization for patient safety is currently debatable. In many patients, immobilization in ICU causes strong emotional response which contributes to the post-traumatic stress disorder. Some

European countries (eg Great Britain, Portugal, where the gold standard is 1 nurse per 1 ICU patient) report abstaining from it completely, while its use reaches 75% in North America, but no large studies have been conducted on this issue so far. Several reports, paradoxically, show higher rate of unplanned extubations, reintubations and accidental catheter removals in immobilized patients [5].

Spontaneous Awakening Trial can be safely initiated in the absence of agitation, active seizures or alcohol withdrawal syndrome, administration of muscle relaxants, signs of active myocardial ischemia, or elevated ICP. If the patient is able to follow commands or survive 4 or more hours off sedation without developing persistent anxiety, agitation, pain, and respiratory distress, the test is considered successful. If the test is unsuccessful, the hypnotics infusion is resumed at half the previous dose and titrated as necessary, and the trial is repeated after 24 hours. If the trial is successful, weaning from the ventilator can be considered [6].

Conclusions. Sedation is an important component of the treatment of critically ill patients in the ICU. Modern approach for sedation involves moving away from prolonged and deep drug-induced sleep toward ensuring the patient is calm and comfortable while maintaining consciousness.

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