INTERRUPTED VERSUS CONTINUOUS SEDATION DURING MECHANICAL VENTILATION IN THE INTENSIVE CARE UNIT

Essay

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بسم الله الرحمن الرحيم

وَأَنْزَلَ اللهُ عَلَيْكَ الْكِتَابَ والْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُنْ تَعْلَمُ وَكَانَ فَضْلُ اللهِ عَلَيْكَ عَظِيمًا

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List of Abbreviations

Abbreviation	Meaning
AEP	Auditory evoked potential
ARDS	Acute respiratory distress syndrome
bd	Two times a day
BIS	Bispectral index
CIVS	Continuous intravenous sedation
CO_2	Carbon dioxide
EEG	Electroencephalography
FDA	Food and Drug Administration
GABA	Gamma-aminobutyric acid
hr	Hour
ICU	Intensive care unit
IV	Intravenous
kg	Kilogram
MAAS	Motor activity assessment scale
mg	Milligram

Abbreviation	Meaning
µg	Microgram
ml	Millilitre
prn	As needed
PTSD	Post-traumatic stress disorder
RASS	Richmond agitation-sedation scale
RSS	Ramsay sedation scale
SAS	Riker sedation-agitation scale
SAT	Spontaneous awakening trial
SBT	Spontaneous breathing trial
$T_{1/2}$	Half life
tds	Three times a day
US	United States
VAP	Ventilator-associated pneumonia
yr	Year

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Introduction

Sedation has become an important part of critical care practice in minimizing patient discomfort and agitation during mechanical ventilation. Pain, anxiety, and delirium form a triad of factors that can lead to agitation. Achieving and maintaining an optimal level of comfort and safety in the intensive care unit plays an essential part in caring for critically ill patients. The goal of sedation is a calm, comfortable patient who can easily be aroused and who can tolerate mechanical ventilation and procedures required for their care ***(Bennett and Hurford, 2011)***.

Adequate assessment and control of sedation play crucial roles in the proper performance of mechanical ventilation ***(Jung et al., 2012)***.

Many methods have been used to assess the sedation level for patients in the intensive care units(ICUs); both objective methods like electroencephalogram (EEG), auditory evoked potential (AEP) and signal-processed EEG - bispectral index (BIS) monitors ***(Fuchs and Rueden, 2008)***, and subjective

methods in the form of sedation scores like Ramsay sedation scale (RSS), Riker sedation-agitation scale (SAS), motor activity assessment scale (MAAS) and Richmond agitation-sedation scale (RASS)***(Mirski et al., 2010)***.

Level of sedation most likely does not affect the stability of physiological status but does have an effect on comfort of the patient***(Grap et al., 2012)***.

Daily interruption of continuous infusion of sedatives has improved outcomes in patients receiving mechanical ventilation. Appropriate sedation should provide comfort without inducing coma ***(Weisbrodt et al., 2011)***.

In patients who are receiving mechanical ventilation, daily interruption of sedative-drug infusions decreases the duration of mechanical ventilation and the length of stay in the intensive care unit ***(Kress et al., 2000)***.

Aim of the Work

To highlight the advantages and disadvantages of both interrupted and continuous sedation in mechanically ventilated patients with respect to duration of mechanical ventilation and length of intensive care unit stay.

Chapter (1)

Sedation in the Intensive Care Unit

ANXIETY DISORDERS IN THE ICU

Anxiety and related disorders (agitation and delirium) are evident in as many as 85% of patients in the intensive care unit (ICU). The common denominator in these conditions is the absence of a sense of well-being. Anxiety is characterized by exaggerated feelings of fear, nervousness, or apprehension that are sustained more by internal than external events. Agitation is a combination of anxiety and increased motor activity. Delirium is a specific syndrome of altered mental status that may or may not have anxiety as a component. Although delirium is often equated with agitation, there is a hypoactive form of delirium that is characterized by lethargy ***(Marino, 2014)***.

SEDATION

Sedation comes from the Latin word "*sedare*" (sedare = to calm or to allay fear). Sedation is the process of establishing a state of calm. Talking to patients and making adjustments in the ICU environment should be the first steps to calm an anxious patient. In the ICU, however, drugs are often needed to calm patients ***(Marino, 2014)***.

Sedation allows the depression of patients' awareness of the environment and reduction of their response to external stimulation. It plays a pivotal role in the care of the critically ill patient, and encompasses a wide spectrum of symptom control that will vary between patients, and among individuals throughout the course of their illnesses ***(Rowe and Fletcher, 2008)***.

Ensuring patient comfort and safety is a universal goal that has been endorsed by national medical societies and oversight bodies. In critically ill patients, anxiety contributes to an already prominent sympathetic stress response that includes increased endogenous catecholamine activity, increased oxygen

consumption, tachycardia, hypercoagulability, hypermetabolism, and immunosuppression. Furthermore, unrelieved anxiety can lead to severe agitation and the removal of lifesaving medical devices (eg, endotracheal tubes and intravascular lines), placing both the patient and health care providers at risk. This may also contribute to significant physical and psychological stress during the acute event and in the future long-term consequences such as post-traumatic stress disorder (PTSD) may develop. Sedatives, therefore, are administered to provide patient comfort and ensure patient safety while decreasing the stress response ***(Hughes et al., 2012)***.

Providers should recognize that sedative medications are considered part of a multimodal approach to ensuring patient comfort and safety. Important aspects also include providing analgesia, maintenance of a normal day-night cycle, patient positioning, and appropriate mechanical ventilation strategies ***(Hughes et al., 2012)***.