

Sedation practices in intensive care units at National Hospital of Sri Lanka

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There is a marked variation in the use of sedation practices in ICUs worldwide. There is no data on sedation practices in Sri Lankan ICUs. This study was conducted to evaluate sedation practices in intensive care units at National Hospital of Sri Lanka (NHSL) with special emphasis on the use of sedation guidelines, scoring systems, practice of sedation interval and the choice of pharmacological agents. A tick-box questionnaire was used to obtain data from the medical officers in-charge of seven intensive care units at National Hospital of Sri Lanka. Only 4 (57.1 %) ICUs at NHSL use a sedation scale. Ramsay sedation scale and Richmond Agitation Sedation Scale (RASS) is used equally by the ICUs. Only 2 (28%) ICUs had a written sedation guideline and 5 (71.6%) ICUs practice daily "sedation hold". None of the ICUs audit their sedation practices. Midazolam and morphine are the frequently used drugs for sedation and analgesia respectively. The choice of sedating agent was mainly influenced by the duration of action than the cost of the drug. Our survey revealed that the current sedation practices in the ICUs need improvement. Use of a written sedation guideline, use of a sedation scale and auditing of sedation practices should be encouraged to improve patient outcomes. We believe that there is an urgent need to implement a national guideline for sedation practices in ICUs in Sri Lanka.

Keywords: Sedation in ICU; sedation hold; sedation scale; sedation guideline

Introduction

Sedation plays a key role in the management of critically ill patients in the intensive care units (ICUs). Patients needing invasive mechanical ventilation require sedation to control symptoms such as anxiety, pain and agitation. Under-sedation has shown to increase the catabolism, thrombosis, and increase the sympathetic activity.¹ However, over-sedation is associated with increased ICU and hospital stay.² This leads to an overall increase in the associated healthcare costs.^{3,4} Achieving the right balance between under-sedation and over-sedation in patients is crucial and provide the best outcome. There is a marked variation in the sedation practices in ICUs. A protocol-based sedation practice improves patient outcome.⁵ Treggiari

MM *et al* compared light versus heavy sedation in intubated patients.

Results demonstrated that lightly sedated group had fewer days of mechanical ventilation and ICU stay while the heavily sedated group had a longer ICU stay and more delusional memories.⁶ Marin H. *et al* showed that the use of continuous intravenous sedation was associated with prolongation of mechanical ventilation.⁷ Similarly, studies have shown that intermittent sedation is better than continuous sedation.⁸ Daily interruption of sedation (sedation hold) reduces ventilation duration, length of ICU stay, complications such as venous thromboembolic disease, upper gastrointestinal bleeding and bacteraemia, and the incidence of post-traumatic stress disorder.⁹ Critically ill patients have multi-organ dysfunction which result in altered pharmacokinetics of prescribed medication. Therefore, the optimum doses of sedatives and analgesics are best judged by regular assessment of the patient to identify the needs. This is best achieved by adopting sedation scales with a scoring system. Numerous scales have been developed and of these, Ramsay scale and Richmond Agitation Sedation Scale (RASS) are used frequently. The type of sedatives and analgesics used influence patient outcome.⁹

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There are established guidelines for the management of sedation in ICUs. Despite the existence of these guidelines, there is a wide variability in sedation practices worldwide.^{10,11} There are no data on the current sedation practices of ICUs in Sri Lanka. Therefore, this audit was conducted to evaluate the sedation practices in the ICUs at National Hospital of Sri Lanka.

Materials and methods

A tick-box questionnaire was used in the survey. This questionnaire was distributed to the medical officer-in-charge of all intensive care units at National Hospital of Sri Lanka (NHSL). Ethical approval was obtained from the ethical committee of NHSL. Data were collected over one month. Data were entered using Microsoft Excel and analyzed using SPSS 19.0 and Graph Pad Prism 7.0 statistical packages.

Results

Data were obtained from the 7 Intensive care units at NHSL namely medical, surgical, cardiothoracic, neurosurgical, neurology, trauma and cardiology. The general descriptive data of the ICUs are outlined in Table 1.

Table 1: General characteristics of the ICUs and the admitted patients

Variable	No of units (%)
Level 3 Beds	
<= 8	2 (28.6 %)
>8	5 (71.4 %)
No of Admissions /month	
<30	1 (14.3%)
30-60	2 (28.4%)
61-90	3 (42.9%)
91-120	1 (14.3%)
% ventilated patients from the total admissions/month	
<=50%	3 (42.9%)
>51%	4 (57.1%)
Predominant origin (type of patients)	
Medical	1 (14.3%)
Surgical	1 (14.3%)
Cardiac	2 (28.6%)
Neuro	1 (14.3%)
Trauma	2 (28.6%)

Table 2 illustrates that only 4 (57.1%) ICUs at NHSL use a sedation scale. Ramsay sedation

scale and RASS score is used equally by the ICUs. Only 2 (28%) of ICUs had a written sedation guideline. Daily sedation hold is practiced in 5(71.6%) ICUs. None of the ICUs audit their sedation practices.

Table 2: Sedation practices among the ICUs at NHSL

Question	No of units (%)
Do you use a sedation scale?	
Yes	4 (57.1%)
No	3 (42.9%)
Which sedation scale do you use? (several answers possible)	
Ramsay Sedation Scale	2 (50%)
RASS	2 (50%)
Do you have a sedation guideline?	
Yes	2 (28.6 %)
No	5 (71.6%)
Do you practice daily sedation hold?	
Yes	5 (71.6%)
No	2 (28.6%)
Do you audit your compliance with your sedation hold guideline?	
Yes	0
No	7 (100%)

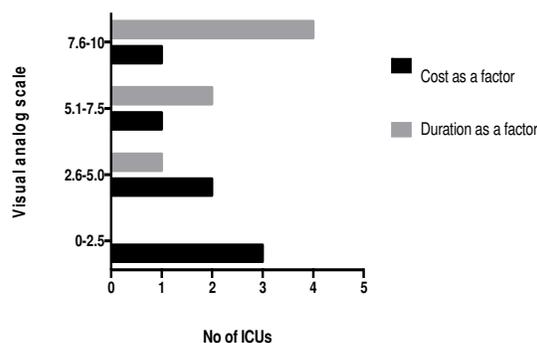


Figure 1: The influence of the cost of the drugs and the duration of the action on deciding the choice of sedating agent.

The visual analog scale (0-not affecting decision, 10- main deciding factor) was used to identify the impact of the cost of the drugs and the duration of the action when deciding on the type of sedative agent. This bar chart demonstrates that the duration of the action of the drug was the main factor considered in the ICUs at NHSL.

Table 3: The sedative used when considering the length of stay/respiratory weaning of patients in the ICUs at NHSL

Drug	Expected Length of stay in ICU		Weaning (No of units)
	<24 hours (No of units)	>24 hours (No of units)	
For sedation			
Midazolam	7	7	0
Propofol	3	2	0
For analgesia			
Morphine	5	7	0
Fentanyl	3	2	1
Epidural	2	2	0

Midazolam was the most frequently used sedative agent irrespective of duration of ICU stay. None of the ICU's change the sedative agent whilst weaning off from mechanical ventilation. Intravenous morphine is the most frequently used analgesic agent followed by fentanyl.

Discussion

Sedation practices

Sedation scoring

Our audit reveals lack of sedation scoring in a significant number of ICUs at NHSL. Only 4 (57.1%) ICUs are using a sedation scale. This is considerably less compared to developed countries.^{12,13} Among the ICUs which use a sedation scale, Ramsay sedation scale and RASS were the tools used. These are the common sedation scoring tools used in most countries. There are various sedation scoring systems used worldwide. However, there is no consensus on the superiority of one over another. RASS scale has shown good performance with regards to inter-rater reliability and validity and can be used to detect changes over time in the critically ill patient.

The most popular scale seems to be the Ramsay scale in countries such as UK, Canada and Germany. The German nationwide survey conducted in 2002 showed that the Ramsay sedation scale was used exclusively.⁹ European survey done in 2000 showed that Ramsay sedation scale was used more frequently in UK than other countries.¹⁴

Sedation Guidelines

Using a sedation guideline has shown to reduce the length of stay and ventilator free days in ICUs.^{5,15,16} There is an increase in the trend to use sedation guidelines in other countries.^{13,17} In our survey, only 2 ICUs (28.6%) used a sedation guideline and none of the ICUs audit their practice.

Sedation interval

Sedation hold has shown to reduce length of stay, increase ventilator free days and result in fewer ICU related complications.^{9,18} Sedation hold is now part of the ventilator care bundle recommended by the surviving sepsis campaign. There are concerns of adverse events such as self-extubation during sedation hold in patients with alcohol and drug abuse. In our survey, majority (71.4%) of ICUs practice sedation hold.

Choice of sedating agent

There is no consensus on the best sedative drugs despite approximately 90 trials comparing sedative regimens. Marked differences in prescribing patterns in countries suggest that the choice of agent is determined by tradition and familiarity than by evidence-based practice.

Recent surveys assessing sedation practices demonstrate that midazolam and propofol remain the dominant medications used for ICU sedation. However, meta-analysis of six trials suggest that sedation with benzodiazepines may increase length of ICU stay compared to non-benzodiazepines. American College of Critical Care Medicine (ACCM) guidelines suggest using sedation with non-benzodiazepine sedatives (propofol or dexmedetomidine) over benzodiazepines (midazolam/lorazepam) to improve clinical outcomes in mechanically ventilated ICU patients.⁹ Furthermore, the guideline suggests using intravenous opioids as the drug of choice to treat non-neuropathic pain in critically ill patients.

In our audit, midazolam was the most frequently used sedative irrespective of the length of ICU stay. Propofol is the only other sedative used in these ICUs. In developed countries, propofol is used more commonly than midazolam.^{10,11,17}

Morphine was used more frequently than fentanyl as the analgesic agent in the ICUs. Developed countries have switched to remifentanyl or alfentanil due to the shorter duration of action

and due to the reduced risk of accumulation. The cost could be a factor in determining the use of these drugs in Sri Lanka.

In our survey, the choice of sedative is mainly influenced by duration of action than the cost of the drug. Only 2 ICUs considered the cost to be a determining factor (visual analog scale >5) in deciding the sedative. (Figure 1)

Study limitations

We have not included paediatric, gynecological ICUs in our study. This could only be generalized to NHSL ICUs. The survey was answered by the medical officer-in-charge rather than all doctors. Therefore, the answers might to some extent reflect the individual practice, and may not be representative of the entire unit. This audit could be used as the platform to conduct a nationwide survey which would provide a better picture.

Conclusion

Majority of ICUs at NHSL do not have a written practice guideline despite using a sedation scoring system. None of the ICUs audit their sedation practice. Ramsay and RASS sedation scales are the exclusively used sedation scales. Sedation hold is done by most but not all the ICUs. Midazolam is the most frequently used sedative and morphine is the most frequently used analgesic. The choice of sedative is influenced by duration of action of the drug than the cost of the drug. There is an urgent need to implement a national sedation guideline to overcome the deficiencies in practice.

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