Research Article

A STUDY TO ASSESS THE SEDATION PRACTICES AND CLINICAL PROFILE AMONG MECHANICAL VENTILATED PATIENTS ADMITTED IN DR. VITTHALRAO VIKHE PATIL PRAVARA RURAL HOSPITAL, LONI BK

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ABSTRACT

Background: Intensive care is a great challenge and demands of a nurse the highest qualities of character and competence. Respiratory care is based on four important principles include the airway must be kept clear, alveolar ventilation must be adequate, arterial blood must be adequately oxygenated, preexisting pulmonary diseases must be treated and complications avoided. In the view of normal gas exchange, tracheal tube intubation and artificial supply of oxygen and gas exchange can be carried out by mechanically for a ventilatory failure patient. Although research studies about pain and sedation in ICU have flourished, little is known about current practices. Questionnaire reported physicians or nurse's preference in the use of scoring system for assessing pain and sedation and of sedatives and analgesics drugs. In addition, the rate of stated use of instruments for assessing sedation can be range between 8% and 49% in Germany and between 16% to 61% in Denmark. **Objectives:** 1. to assess the sedation practices and clinical profile among mechanical ventilated patients. 2. To find out the association between sedation practices with the selected demographic and clinical characteristics of the mechanical ventilated patients. **Material and methods:** A descriptive study was conducted on 60 mechanical ventilated patients to assess the assess the sedation practices and clinical profile among mechanical ventilated patients admitted in in Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk. Participants were selected by non probability purposive sampling technique, who fulfilled eligibility criteria. A Structured Performa was used for the data collection, it included socio-demographic data, clinical characteristics and health assessment of the patient under sedation by Richmond agitation and sedation scale, Riker sedation agitation scale, Glasgow coma scale and the depth of sedation. Data was collected from August 2023 to November 2023 and analysed by using descriptive and inferential statistics. **Result:** Findings of the study revealed that the mechanical ventilated patients are having moderate sedation practices. Richmond Sedation Agitation scale (+4 to -5) shows that 90% of the participants had light sedation (-2); as per Riker sedation agitation scale (1 to 7) shows that 86.7% participants scored 3 i.e., "sedated". According to Glasgow Coma scale (3 to 15) maximum participants scored moderate consciousness i.e., 78.3%; as per depth of the sedation, majority of the participants shows moderate depth of sedation i.e., 61.7%. Chi square test shows that there is no significant association between sedation practices with the selected demographicand clinical characteristics likeage, education, occupation, monthly income, type of family, religion, duration of ventilation and duration of sedation. **Conclusion:** The overall goal of the sedation is to provide stability in physiological status and comfort of the mechanical ventilated patients. Inappropriately high level of the sedation may lead to alterations in the vital functions of the body. Although this study focused on identifying the sedation practices and clinical profile among mechanical ventilated patients. The findings of the present study revealed that majority of the mechanical ventilated patients were moderately or lightly sedated and the level of consciousness after the sedation were moderate. Thus, it concluded that the mechanical ventilated patients are poorly sedated during the period of mechanical ventilator support.

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INTRODUCTION

Intensive care is a great challenge and demands of a nurse the highest qualities of character and competence. In emergency, mouth to mouth resuscitation can be carried out or the patient can be manually ventilated with bag and mask. But for a prolonged period, artificial ventilation, tracheal tube intubation and mechanical ventilator support are needed.[1] A patient with ventilator failure is hypercapnic and hypoxic. These clinical signs of ventilatoryfailure are due to these changes in blood gases and to the attempts of the body to correct them.[2]

The PAD guidelines suggest that analgesia and first sedation be used in mechanically ventilated adult ICU patients and that sedation strategies using non- benzodiazepines sedatives, may be preferred over sedation with benzodiazepines. Sedation is often used for patients on long term ventilation, although there is plenty of debate in medical circles concerning the over use of sedation.[3] The use of sedation is often depending on the patient who is calm during normal life is usually calm on a ventilator while in an ICU unit. The two arms of awake intubation are local anesthesia and systemic sedation. Some patient's need to be sedated for hours, days or even weeks.[4]

Scientific studies show that there has been an increase in the number of patients who are placed on mechanical ventilator as a greater number of hospitals in India have started maintaining ICU equipped with ventilator. These patients in the ICU on mechanical ventilator require sedation and analgesia in order to tolerate endotracheal tube, to lie down in the same position for the long time, to prevent desynchrony with the ventilator, to tolerate many of the procedures for the optimization of oxygenation and for patient safety. [5]Nevertheless, providing patients with an optimal level of sedation is a challenging act. Patients who are inadequately sedated are more likely to remain anxious, experience the ventilator desynchrony, remove invasive devices and experience post-traumatic stress disorder. [6]

Other problems arising from under sedation are increased stress symptoms such as hypermetabolism, sodium and water retention, substrate mobilization, lipolysis, altered vital signs, cardiovascular symptoms and delayed wound healing. Conversely, patient who become over sedated are more difficult to liberate from mechanical ventilator and thus are at great risk for developing complications such as ventilator associated pneumonia and excessive sedation can also contribute to hypotension, increased risk of prolonged stay in ICU, with an increased burden on staff, bed availability and associated cost.[7]

A national survey on routine regarding sedation in Swedish intensive care units shows a result of fifty out of eighty ICU's responded to the survey. All units used sedation scales, and 88% used the RASS scale, 80% used written guidelines for sedation. Propofol, dexmedetomidine were the preferred short term hypnosedatives.Propofol, dexmedetomidine and midazolam were preferred for long term hypnosedation. Remifentanil, morphine and fentanyl were the most frequently used agents for analgosedation. As conclusion, all the ICU's used a sedation scale, an increase compared with previous studies.[8]

Statement of the Problem

A study to assess the sedation practices and clinical profile among mechanical ventilated patients admitted in Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.

Objectives

1. To assess the sedation practices and clinical profile among mechanical ventilated patients.
2. To find out the association between sedation practices with the selected demographic and clinical characteristics of the mechanical ventilated patients.

MATERIAL AND METHODS

A descriptive study was conductedtoassess the sedation practices and clinical profile among mechanical ventilated patients admitted inDr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk. The setting of the present study was the Intensive Care Units of Dr Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital is 1275 bedded multi-disciplinary; super specialty medical institute located in Loni Bk, Ahmednagar, Maharashtra, India.

The study consist of 60 mechanical ventilated patients Participants were selected by non probability purposive sampling technique, who fulfilled eligibility criteria. The mechanical ventilated patient under sedation and availableduring the study period were selected for the study. The mechanical ventilated patients admitted in Paediatric Intensive Care Unit and Neonatal Intensive Care Unit were excluded from the study. The study participants were selected from the Medical Intensive Care Unit, Surgical Intensive Care Unit and Coronary Care Unit of Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.A Structured Performa was used for the data collection. The data collection tool consisted of three sections. Section A deals with the information related to socio-demographic data, section B deals with clinical characteristics and section C consisted of the health assessment of the patient under sedation by Richmond agitation and sedation scale, Riker sedation agitation scale, Glasgow coma scale and the depth of sedation. Standardized scale was used for assessing the sedation practices and clinical profile of the mechanical ventilated patients.

Data collection procedure

Prior to the study, ethical approval obtained from the institutional ethical/ research committee of PIMS (DU).
Written permission obtained from the Medical Superintendent of Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk.
Informed consent taken from the relatives of the subjects. The demographic data of the mechanical ventilated patients were collected from the relatives.The data was collected during August 2023 to November 2023.

Statistical methods

Data was coded in the Microsoft excel sheet. Descriptive and inferential statistics were used for data analysis. Frequency and percentage used to analyze data regarding demographic variables and clinical characteristics. Mean and standard deviation (SD) were used to measure the sedation practices and clinical profile.

RESULTS

Demographic variables and clinical characteristics of the mechanical ventilated patients

Table 1 Description of participants according to their demographic and clinical characteristics

n= 60

Sr no	Variables	Frequency	Percentage
1.	Age		
	1.1. 18-30 years	03	5%
	1.2. 31-40 years	04	6.7%
	1.3. 41-50 years	10	16.7%
	1.4. 51-60 years	29	48.3%
	1.5. Above 60 years	14	23.3%
2.	Gender		
	2.1. Male	41	68.3%
	2.2. Female	19	31.7%
3.	Education		
	3.1. No formal education	08	13.3%
	3.2. Primary school	09	15%
	3.3. Secondary school	27	45%
	3.4. Higher secondary school	14	23.3%
	3.5. Graduate and above	02	3.3%
4.	Occupation		
	4.1. Unemployed	15	25%
	4.2. Daily wager	10	16.7%
	4.3. Home maker	17	28.3%
	4.4. Government Employee	02	3.3%
	4.5. Private sector	16	26.7%
5.	Monthly income		
	5.1. Below Poverty Level	42	70%
	5.2. Above Poverty Level	18	30%
6.	Type of family		
	6.1. Nuclear	19	31.7%
	6.2. Joint	37	61.7%
	6.3. Extended	04	6.6%
7.	Religion		
	7.1. Hindu	39	65%
	7.2. Christian	07	11.7%
	7.3. Muslim	14	23.3%
8.	Mode of Ventilation		
	8.1. VC	48	80%
	8.2. SIMV	04	6.7%
	8.3. PCV	08	13.3%
9.	Duration of ventilation		
	9.1. 1 day	43	71.7%
	9.2. 2-5 days	14	23.3%
	9.3. 6-10 days	03	5%
10	Duration of sedation		
	10.1. 0-3 days	54	90%
	10.2. 3-6 days	06	10%

Table.No.1 shows the distribution of participants according to their demographic and clinical characteristics. It shows that 48.3% of mechanical ventilated patients belongs to the age group 51-60 years followed by 23.3 % belongs to the age group above 60 years. Majority (68.3%) participants were male and 31.7% were female. Educational qualification shows that majority of the participants completed (45%) secondary school followed by higher secondary school (23.3%).Majority of the participants were (28.3%) home maker followed by private sector (26.7%). Monthly income depicts that the highest percentage (70%) of the participants belongs to Below Poverty Level and 30% belongs to Above Poverty Level. Majority (61.7%) of the participants are living in joint family followed by 31.7% of participants living in nuclear family. Religion shows that 65% participants are Hindu and 23.3% and 11.7% are Muslim and Christian respectively. Majority of the mechanical ventilator patients under sedation were on VC mode of ventilator. Highest percentage of the participants (71.7%) on mechanical ventilator for the duration of one days followed by 23.3% for 2-5 days. 90% of the participants on sedation for 0-3 days.

Health assessment of the patient under sedation

The sedation practices and clinical profile of the mechanical ventilated patients were assessed by using standardized scales including Richmond Agitation and Sedation Scale (RASS), Riker's sedation agitation scale, Glasgow coma scale (GCS) and the depth of sedation. RASS is a medical scale used to measure the sedation level of a person; is a 10 points scale ranges from +4 to -5. Positive RASS denotes the level of aggressive behaviour, negative RASS denote less responsiveness and a zero score signifies calm and alert patients.[9] In this study, majority (90 %) of the participants having light sedation (-2), it has a score of 7 out of 10 and followed by 10% that is moderate sedation (-3) it has a score of 8 out of 10.

Riker sedation agitation scale uses a numeric score from 1 to 7 to assess the level of patient sedation and is especially adapted to warn the clinician of "unarousable" and "dangerous agitation" level of sedated patient.[10] In this study, majority (86.7%) of the participants scored 3 that is "sedated" and 13.3% scored 4 that is "calm and cooperative".

The GCS is the summation of scores for eye, verbal, and motor responses. The minimum score is a 3 which indicates deep coma or abrain-dead state. The maximum is 15 which indicates fully awake. The initial score correlates with the severity of brain injury and prognosis. The Glasgow Coma Scale provides a score in the range 3-15; 8 score or less is considered as severe, 9-12 is considered as moderate and 13-15 is considered as mild.[11] In this study, majority (78.3%) of the participants were scored moderate and 21.7% were scored mild.

Continuum of Depth of sedation depicts that the minimal sedation is equivalent to anxiolysis, moderate sedation is depression of consciousness, which patient respond purposefully. In deep sedation, patient cannot be easily aroused but purposefully respond. But in general anaesthesia, a drug induced loss of consciousness, patient is not arousable.[12] In this study, highest percentage of the participants belongs to moderate sedation (61.7%) followed by mild sedation (38.3%).

Table 2 Assessment of sedation practices and clinical profile among mechanical ventilated patients.

n=60

Sr no	Aspect of sedation practices	Mean	SD
1.	Richmond sedation agitation scale	7.1	±0.30
2.	Riker sedation agitation scale	3.13	±0.34
3.	GCS score	10.97	±1.47
4.	Depth of sedation	3.38	±0.49

Table No.2 depicts the mean and standard deviation of the sedation practices and clinical profile among mechanical ventilated patients. In that that the overall mean score of sedation practices on the basis of Richmond sedation agitation scale shows "light sedation" (7.1±0.30), Riker sedation agitation scale shows "poorly sedated" (3.13±0.34), Glasgow coma scale shows "moderate score" (10.97±1.47) and depth of sedation shows "moderate sedation" (3.38±0.49).

Table. No.3 depicts the association between sedation practice and the selected demographic and clinical characteristics of the mechanical ventilated patients. The findings revealed that there

was significant association between sedation practices and demographic variables like gender and mode of ventilation and there was no significant association between sedation practices and demographic variables like age, education, occupation, monthly income, type of family, religion, duration of ventilation and duration of sedation.

sedation for mechanically ventilated patients. Even when the sedation endpoints are specified, the actual depth of sedation is often greater than desired. Findings of the study was consistent with the study conducted by Jill L Guttormson, Linda Chlan et al, regarding the factors, influencing the nurse sedation practices with mechanically ventilated patients, Australia.[17]

Table 3 Association between sedation practices with the selected demographic and clinical characteristics of the mechanical ventilated patients.

n=60

Sr. no.	Variables	X^2 Calculated	X^2 Table	Degree of Freedom	Level of Significance
1.	Age	0.98	12.59	6	Non-significant
2.	Gender	13.4	9.49	4	Significant
3.	Education	1.78	12.59	6	Non-significant
4.	Occupation	3.18	16.92	9	Non-significant
5.	Monthly income	11.2	12.59	6	Non-significant
6.	Type of family	4.22	7.81	3	Non-significant
7.	Religion	5.41	12.59	6	Non-significant
8.	Mode of ventilation	20.14	12.59	6	Significant
9.	Duration of ventilation	4.22	12.59	6	Non-significant
10.	Duration of sedation	8.38	12.59	6	Non-significant

$P<0.05$

DISCUSSION

The present was undertaken to assess the sedation practices and clinical profile of mechanical ventilated patients admitted in Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni Bk. The study revealed that that 48.3% of mechanical ventilated patients belongs to the age group 51-60 years followed by 23.3 % belongs to the age group above 60 years; 68.3% participants were male and 31.7% were female; educational qualification shows that 45% of the participants completed secondary school and 23.3% higher secondary school; occupational status 28.3% home maker followed by private sector (26.7%).; monthly income depicts that 70% of participants belongs to Below Poverty Level and 30% belongs to Above Poverty Level; 61.7% of the participants are living in joint family followed by 31.7% of participants living in nuclear family. Religion shows that 65% participants are Hindu and 23.3% and 11.7% are Muslim and Christian respectively. Majority of the mechanical ventilator patients under sedation were on VC mode of ventilator; 71.7%on mechanical ventilator for the duration of one days followed by 23.3% for 2-5 days. 90% of the participants on sedation for 0-3 days.

Findings of the present study was supported by a study conducted by Romina Aragon, William Checkley et al which also stated that the majority of the mechanical ventilated patients were male (55%) and within an age group of above 50 years(60%).[16]

Findings related to the sedation practices and clinical profile among mechanical ventilated patients

Findings of the present study concluded that the sedation level of the mechanical ventilated patients according to the Richmond Sedation Agitation scale (+4 to -5) shows that 90% of the participants had light sedation (-2); as per Riker sedation agitation scale (1 to 7) shows that 86.7% participants scored 3 i.e., "sedated". According to Glasgow Coma scale (3 to 15) maximum participants scored moderate consciousness i.e., 78.3%; as per depth of the sedation, majority of the participants shows moderate depth of sedation i.e., 61.7%.

Guidelines from the Society of Critical Care Medicine identify an easily arousable and calm patient as the desired level of

Findings related to the sedation practices and selected clinical and demographic variables of the mechanical ventilated patients

Chi square values were calculated to find out the association between the sedation practices and selected clinical and demographic variables of the mechanical ventilated patients. The findings revealed that there was no significant association between sedation practices and demographic variables like age, education, occupation, monthly income, type of family, religion, duration of ventilation and duration of sedation and there was significant association between sedation practices and demographic variables like gender and mode of ventilation. Findings of the study was supported by the study conducted by Emily Wiederander, Chris Carter and Emily Buchanan regarding the sedation practices for mechanically ventilated patients in a community hospital intensive care unit.[18]

CONCLUSION

Sedation and analgesia are essential components in the care of mechanically ventilated patients in the intensive care unit to provide comfort, improve patient ventilator synchrony and reduce anxiety and agitation however, deep sedation has been associated with negative patient centered outcomes.[19]The findings of the present study revealed that majority of the mechanical ventilated patients were moderately or lightly sedated and the level of consciousness after the sedation were moderate. Thus, it concluded that the mechanical ventilated patients are poorly sedated during the period of mechanical ventilator support.

Conflict of Interest: No conflicts of interest were declared by the authors.

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