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An Observational Study of Discomforts in Patients Admitted In ICU at A Tretiary Care Hospital

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Abstract
Introduction:
Patients admitted to Intensive Care Units (ICUs) may endure a variety of discomforts, which may or may not be detected. These discomforts may be caused by the environment may be associated with ICU care and discomfort associated with the patient's health status and critical care actions.
Aim:
Identifying the many discomforts in ICU patients, classifying them with their respective causes, determining the most common reason among them, and determining whether ICU sedation aids in lowering discomforts.
Method:
This observational study was conducted from 15th July to 15th October 2022 on 120 mixed ICU patients in Narayan Medical College & Hospital, Sasaram, Bihar. Patients who were admitted to ICU for more than 24 hours, aged 18 years and above, those who gave written informed consent were observed and enquired for any discomfort. Discomforts have been identified and recorded by a fulltime intensivist by direct observation, by interacting with the patients and asking the family members and others (indirect approach). Through this study discomforts of critically ill patients were broadly classified into four categories 1. Due to existing illness, 2. Due to ICU interventions 3. Due to improper nursing care and 4. Due to environmental factors. All study participants were subjected to all of the investigations included in the proforma. The data was analysed using Microsoft Excel.
Result:
Out of 120 patients studied, 84 patients (70%) reported some kind of discomfort during their ICU stay. Existing illness was the most common cause of discomfort, 80 patients (66.6%) suffered due to it. ICU interventions was the second most common cause, 71 patients (59.1%) had discomfort due to interventions. Thirty-five patients (29.1%) suffered due to improper nursing care and 25 patients (20.8%) suffered due to the environmental factors. In this study, it was observed that sedation reduces all kind of discomforts.
Conclusions:
In this study, 70% of patients admitted to ICU for various illnesses reported some level of discomfort.
Existing sickness was the most common cause of ICU discomforts, followed by ICU interventions. Sedation was found to alleviate all types of discomforts in this investigation. Patients who were sedated tolerated the endotracheal tube better and experienced less environmental and procedure-related discomforts. Based on the findings of this study, it is advised that nurses' and doctors' ICU charts include a distinct column for mentioning discomforts during different duty shifts. However, discomfort can be decreased by using suitable analgesics and sedation.

Keywords: *Pain: Sedation: Stressful extubation.*

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I. INTRODUCTION

Patients hospitalised to the ICU have a variety of discomforts, which may or may not be detected[1,2]. These discomforts may be caused by the environment (noise, excessive light), by ICU care (frequent monitoring, isolation), or by the patient's health status and critical care interventions (pain, mechanical ventilation, pleural drain, intravenous access, urinary catheter, nasogastric tube). Some authors categorise discomforts as physical (pain, coldness, heat, thirst, and hunger) or psychological (isolation, worry, communication restriction, lack of respect for intimacy)[3,4]. These discomforts may cause patients to become

agitated and/or confused during their ICU stay, which is known as ICU delirium[5-8], or anxiety and depression[9], or post-traumatic stress disorder[10,11,12], affecting the patient's quality of life[13].

Patients may acquire a phobia of the ICU as a result of these discomforts[14,15]. This may result in patient admissions to the ICU at a worsened health condition, which may have a detrimental effect on patient outcomes.

Because of apparent reasons, assessing discomforts in ICU patients can be more difficult than rating discomforts in non-ICU patients. Some investigations used noise[16], lighting [17], and physiologic factors [18] as stressor indicators, but these did not fully address patient discomfort, particularly self-perceived discomfort. When compared to objective indicators, patient reported outcomes are a better indication of patient feelings and perceptions [19-22]. As a result, various ICU-related reported discomfort tools have been developed. The goal of this study was to identify several types of discomfort and their causes in ICU patients at a Tertiary Care Hospital in India, as well as to determine the most common source of discomfort and whether ICU sedation helps to reduce these discomforts.

II. MATERIALS AND METHODS

This observational study was conducted from 15th July to 15th October 2022 on 120 mixed ICU patients in Narayan Medical College & Hospital, Sasaram, Bihar. Patients who were admitted to ICU for more than 24 hours, aged 18 years and above, those who gave written informed consent were observed and enquired for any discomfort.

INCLUSION AND EXCLUSION CRITERIA

All ICU patients above 18 years of age and who had needed prolonged ICU admission (more than 24 hours) were included in this study. Patients who were transferred to other centres during the course of treatment and those who themselves or their legally acceptable relatives were not willing to give informed consent, were excluded from the study. Patients were observed and enquired for any discomfort. Discomforts were identified and recorded by a fulltime intensivist by direct observation, by interacting with the patients and asking the family members and others (indirect approach). The discomforts were broadly classified into four categories- due to existing illness, due to ICU intervention, due to improper nursing care and due to environmental factors. A 3-point Likert scale was used to rate intensity of discomfort. Patients were asked whether discomfort was present and if present, then to rate its severity (1=not very distressing; 2=moderately distressing and 3=very distressing).

STASISTICAL ANALYSIS

Fisher-exact test was used to compare characteristic of patients who had, with those who did not had any discomfort, the statistical significance was defined as $p<0.05$ Analyses was performed using SAS 9.4 (previously "Statistical Analysis System").

III. RESULTS

A total of 120 patients were included in this study, the age varied between 18 to 87 years (mean age of 57 years). There were 72 male patients and 48 female patients, with a male to female ratio of 1.5:1. There were 64 patients in surgery-trauma group and 56 patients in medical group [Table/Fig-1]. Total 86 patients were on mechanical ventilation and received sedation in form of continuous infusion of propofol or midazolam or a combination of midazolam with fentanyl; four patients were on non-invasive ventilation without any sedation. Remaining 30 patients did not require ventilatory support, among these four were given midazolam to alleviate anxiety.

Surgery- trauma group (64 patients)	Medical group (56 patients)
Road traffic accidents- 22 patients	Chronic/Acute Renal Failure (CRF/ARF)- 12 patients
Postoperative- 42 patients	Acute Respiratory Distress Syndrome (ARDS)- 12 patients
Planned high-risk surgeries-20 patients	Cerebro-Vascular Accident (CVA)- 9 patients
Emergency surgeries- 16 patients	Myocardial Infarction- 8 patients
Postoperative complications-6 patients	Snake bite- 4 patients
	Miscellaneous causes- 11 patients

[Table/Fig-1]: Reason for ICU admissions (n=120).

In this study, 30 patients were fully conscious and among 90 sedated patients 9 were unconscious and 81 were consciously sedated. In conscious and consciously sedated patients, assessment of discomfort was done by direct observation, interaction and indirect approach. In case of remaining 9 unconscious patients,

assessment of discomfort was done by indirect approach only. Out of 120 patients studied, 84 patients (70%) were found to have some kind of discomfort. The prevalence of discomfort was less in sedated group {60 out of 90 (66.6%)} as compared to non-sedated group {24 out of 30 patients (80%)} however, the difference was not statistically significant (p>0.05). Maximum number of patients suffered due to existing illness, followed by ICU interventions and improper nursing care whereas, least number of patients suffered due to environmental cause. Total 80 patients (66.6%), 58 from sedated group and 22 from non-sedated group, had discomforts due to existing illness. Percentage of patients reporting discomforts was less in sedated group (64.4%) than non-sedated group (73.3%), the difference was not statistically significant p>0.05. Pain was the most common cause of discomfort due to the existing illness {61 (50.8%)} [Table/Fig-2].

Cause of discomforts*	Number of patients showing discomforts due to existing illness 80 (66.6%)		
	Total	Sedated** (58, 64.4%)	Non-sedated** (22, 73.3%)
Pain	61 (50.8%)	42	19
Difficulty in breathing	22 (18.3%)	14	8
Fever	21 (17.5%)	15	6
Delirium	19 (15.8%)	15	4

[Table/Fig-2]: Discomforts due to existing illness.

*As patients could report more than one source of discomfort so, summation of percentage exceeds category's percentage and may exceed 100%; **N for sedated group is 90 and for non-

ICU intervention caused discomforts in 71 patients (59.1%). The prevalence of discomfort due to ICU intervention was more in sedated group (61.1%) as compared to non-sedated group (53.3%); it was not statistically significant p>0.05. The higher prevalence of discomfort in sedated group due to ICU intervention was mainly because of endotracheal intubation, as all intubated patients were sedated and it is a major source of discomfort. Out of 86 intubated patients, 52 patients suffered (60.46%) intubation related problems. In whole study group, percentage of intubation related discomfort was 43.3%. Majority of the patients (25%) reported extubation as a stressful event. Regarding other ICU interventions, all patients who were admitted to ICU for more than 24 hours (which is one of the inclusion criteria of study) must have regular blood pressure monitoring, intravenous line and urinary catheter (n=120). Pain and injury due to the Blood Pressure (BP) cuff was reported in 46 patients (38.3%). Repeated blood sampling was cause of pain and skin irritation in majority of the patients (40, 33.3%) [Table/Fig-3].

Cause of discomforts*	Number of patients showing ICU discomforts 71 (59.1%)		
	Total	Sedated** (55, 61.1%)	Non-sedated** (16, 53.3%)
1. Endotracheal tube	52 (43.3%)	52	0
Stressful extubation and sore throat	30 (25%)		
Hoarseness of voice after extubation	4 (3.3%)		
Communication difficulties	22 (18.33%)		
2. BP cuff	46 (38.3%)	36	10
3. Repeated blood sampling	40 (33.3%)	32	8
4. Tubings and catheters	33 (27.5%)	21	12
Pain at canula site	33 (27.5%)		
Extravasations of drug	14 (11.6%)		
Superficial thrombophlebitis	4 (3.3%)		
Burning sensation in urethra	11 (9.1%)		
Stabbing pain in suprapubicarea	6 (5%)		

[Table/Fig-3]: Discomforts due to ICU interventions.

*As patients could report more than one source of discomfort so, summation of percentage exceeds category's percentage and may exceed 100%; ** N for sedated group is 90 and fornonsedated group are 30

Total 35 patients (29.1%), 20 from sedated group and 15 from non-sedated group, reported discomfort due to improper nursing care. The prevalence was less in sedated group (22.2%) as compared to non-sedated group; it was statistically significant p<0.05. Majority of the patients (21,17.5%) complained of one or more

episode of hunger or thirst due to improper feeding by nursing staff. Nine patients (7.5%) were from different regions of country and were unable to understand the local language and English which caused much distress to them. Four patients (3.3%) suffered from foul smell and rash due to improper body cleaning [Table/Fig-4].

Cause of discomforts*	Number of patients showing discomforts due to improper nursing care (35, 29.1%)		
	Total	Sedated** (20, 22.2%)	Non-sedated** (15, 50%)
Hunger or thirst	21 (17.5%)	12	9
Pressure ulcers	4 (3.3%)	3	1
Language problems	9 (7.5%)	5	4
Foul smell	4 (3.3%)	2	2

[Table/Fig-4]: Discomforts due to improper nursing care.

*As patients could report more than one source of discomfort so, summation of percentageexceeds category's percentage and may exceed 100%; **N for sedated group is 90 and for non sedated group is 30

Environmental factors were cause of discomforts in 25 patients (20.8%), 14 from sedated group and 11 from non-sedated group. The prevalence of discomfort due to environmental factors was less in sedated group (15.5%) than non-sedated group (36.6%) and was also statistically significant $p<0.05$ [Table/Fig-5].

Cause of discomforts*	Number of patients showing discomforts due to environmental factors (25, 20.8%)		
	Total	Sedated* (14, 15.5%)	Non-sedated* (11, 36.6%)
Noise	16 (13.3%)	6	10
Anxiety	11 (9.1%)	3	8
Difficulty to sleep	10 (8.3%)	2	8
ICU temperature	9 (7.5%)	4	5

[Table/Fig-5]: Discomforts due to environmental factors.

*As patients could report more than one source of discomfort so, summation of percentage exceeds category's percentage and may exceed 100%; **N for sedated group is 90 and for non sedated group is 30

IV. DISCUSSION

Admission to an ICU can be a stressful life event, especially if the cause for admission is serious or even life-threatening. The identification of ICU discomforts may have an impact on patient treatment. In this study, 70% of patients admitted to the ICU expressed some level of discomfort. In a study conducted by van der Leur JP et al., it was discovered that 54% of ICU patients discharged had a remembrance of discomfort throughout their stay[23]. Another study[24] found that 34% of mechanically ventilated patients and 66% of non-mechanically ventilated patients experienced discomfort.

The major cause of discomfort from the existing illness was pain with 61 patients (50.8%) complained or showed visible/ physiological signs of pain. In a study[24], 40% of patients admitted in ICU reported pain. Another study which was conducted in 44 ICUs in France, up to 51% of 1381 mechanically ventilated patients had substantial non-procedure related pain[25]. The incidence of pain was found to be 38% in a study conducted in 230 ICUs[26]. Difficulty in breathing was the most distressing symptom, 22 patients (18.3%) complained of dyspnoea in the present study. Although dyspnoea often precipitates the use of mechanical ventilation, there was no difference in intensity of dyspnoea between the patients who were on mechanically ventilated and those who were not on mechanical ventilation[27]. Although in previous studies it was found that patient on mechanical ventilation experienced dyspnoea[28-30], the pathophysiological mechanisms for, and iatrogenic sources of dyspnoea warrant additional investigation. As dyspnoea is very distressful symptom, Intensivist need to perform routine assessment of dyspnoea especially in mechanically ventilated patients. Fever is commonly observed in critically ill patients and is defined as a rise in core body temperature to 38°C or more. Fever occurs in response to various infectious and non-infectious aetiologies. In present study, 21 patients (17.5%) suffered from fever during their ICU stay. According to previous studies elevated body temperature is associated with approximately 50% of ICU admissions[31-35]. Fever is associated with increased mortality in subpopulation of critically ill patients[36]. Optimal approach to manage hyperpyrexia in critically ill patients remain controversial

till date. In this study, delirium was found in 19 patients (15.8%), whereas another study reported that 34% of ICU admissions suffered from delirium. Assessment of delirium must be done on routine basis, as it has adverse effect on ICU patient outcome. The endotracheal tube was a major cause of discomfort due to the ICU interventions with 52 patients (43.3%) complained some form of discomfort. Thirty patients (25%) reported extubation as a stressful event. This finding is comparable to another study [23] who reported endotracheal tube as a source of discomfort in 42% of patients. According to a study conducted by Samuelson KA, 88% of patients rated their endotracheal tube related discomfort as moderately to extremely stressful[37]. Ventilator dependent patients are often deprived of communication due to the intubation, in this study 22 patients (18.3%) suffered from communication difficulties. Whereas, inability to talk was reported by 9% patients in a study conducted by van der Leur JP et al.. Loss of speech give rise to severe emotional reaction such as anxiety and frustration. The BP cuff was the second most common cause of discomfort due to the ICU interventions, 46 patients (38.3%) reported discomfort due to continuous monitoring of blood pressure. Repeated inflation of cuff resulted in pain and numbness in arm. A case of extensive skin necrosis due to BP cuff in a critically ill patient was reported by Devbhandari MP et al.[38]. Third most common cause of discomfort due to ICU interventions was repeated sampling, a total of 40 patients (33.3%) reported pain and skin irritation at sampling sites due to repeated blood samplings. In a study conducted by Turner JS et al., 48% of patients reported arterial blood gas sampling as a painful event [39]. Tubing and catheters were source of discomfort in 33 patients (27.5%). Fourteen patients (11.6%) reported swelling at canula site due to extravasation of drug in soft tissues, superficial thrombophlebitis was noted in 4 patients (3.3%) and pain was complained by all 33 patients (27.5%). Eleven patients (9.1%) reported discomforts related to the urinary catheter causing burning sensation in urethra, 6 patients (5%) also complained of stabbing suprapubic pain with an urge to void. In this study episodes of hunger and thirst were reported by 21 patients (17.5%), whereas, only 9% patients reported thirst in a study conducted by van der Leur JP et al.. Four patients (3.3%) developed pressure ulcers due to infrequent positioning by staff. The incidence of pressure ulcers was reported to be 31.4% in a study conducted by He M et al.,[40]. The noise made by monitors and murmuring of ICU staff was the most common cause of the environmental discomfort. The findings corelate to that of another study that reported 14% of ICU patients suffering due to noise and bustle. Anxiety was reported in 11 patients (9.1%) and sleep disturbances in 10 patients (8.3%), anxiety was more common in mechanically ventilated patients. In fact, in one study, 85% of 106 mechanically ventilated patients reported some anxiety, and it was moderate to severe in 69% of patients[41]. The lesser prevalence of anxiety in the present study is because of less mechanically ventilated patients and also may be due to under reporting by the patients. These finding suggest that intensivist need to perform systematic assessment of anxiety and use both pharmacologic and non-pharmacologic measure to alleviate this symptom. In this study, it was discovered that sedation made patients more tolerant of various discomforts. Patients become anxious when the sedative wears off and try to rip out the endotracheal tube and catheters. Non-sedated patients were also shown to be more susceptible to environmental and procedure-related discomforts.

V. CONCLUSION

In this study, 70% of patients admitted to ICU for various illnesses reported some level of discomfort. Existing illness was the most common cause of distress in critically sick patients, followed by ICU procedures. Sedation was found to alleviate all types of discomforts in this investigation.

Sedated patients tolerated the endotracheal tube better and experienced less environmental and procedural discomforts. Based on the findings of this study, it is advised that nurses' and doctors' ICU charts include a distinct column for mentioning discomforts during different duty shifts. However, discomfort can be decreased by using suitable analgesics and sedation.

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