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PAIN ASSESSMENT AND MANAGEMENT OF PATIENTS IN INTENSTIVE CARE UNIT IN A TERTIARY CARE HOSPITAL

Oral Medicine

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ABSTRACT

Pain is an unpleasant sensation localised to a part of the body that everyone experiences at least once in their entire life. Prompt relief of pain instils a massive confidence in the patient regarding the doctor's ability to treat effectively. It is a cross- sectional study, conducted in Intensive Care Unit, Saveetha Medical College and Hospital . A total of 100 patients were included in the study. A special book was maintained to collect the data from the patients. All the patients were questioned or assessed by the principle investigator. NRS was used for patients who were able to communicate and BPAS was used for patients who were not able to communicate like those who were critically ill, sedated and mechanically ventilated patients. Even during rest intensive care unit patients are having pain which increases the chance of chronic pain and posttraumatic stress disorders. Best ways to screen the patients for pain is grading of pain routinely after procedures using various pain assessment technique.

KEYWORDS

Pain, ICU, NRS, BPAS etc.

INTRODUCTION

Pain is an unpleasant sensation localised to a part of the body that everyone experiences at least once in their entire life. . The International Association for the Study of Pain (IASP) has defined pain as ' an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.' Basically pain is a warning signal and indicates that there is an impairment of structural and functional integrity of the body. Prompt relief of pain instils a massive confidence in the patient regarding the doctor's ability to treat effectively.

Pain has to be analysed in the following way: Site, Character and severity, Duration, Frequency and periodicity, Radiation, Aggravating factors, Relieving factors and associated factors

There are various classification of pain. Pain can be classified into two types as follows: Nociceptive- which is caused due to a direct stimulation of the peripheral nerve endings by burns, trauma or ischemia and Neuropathic- which is due to dysfunction of the pain perception system within the central nervous or peripheral system as a result of any injury, damage due to surgery or disease. Pain can also be classified as Somatic pain, visceral pain and Neuropathic pain. Pain can also be classified as the follows based on the location: Bone pain, Increased intracranial pressure, Abdominal colic, Liver capsule pain, Neuropathic pain, Ischemic pain and Incident pain

Most of the intensive care patients experiences pain during their stay in ICU which serves great sense of stress to them. Due to various treatment procedures like use of mechanical ventilation or high doses of sedatives or muscle relaxant make to patient unable to self report pain. The incidence of significant pain is still 50% or higher in both medical and surgical ICU patients [1]. In addition to experiencing pain at rest, pain related to surgery, trauma, burns, and cancer, these patients experience procedural pain. The main reason of stress due to pain is because of procedural pain which is a significant problem Nursing care procedures such as bathing, massage of back and pressure points, sheets change and repositioning are the most common painful procedures in ICU patients [1].The stress response due to pain has serious adverse effects in intensive care patients. It increases the circulating catecholamine levels and causes arteriolar vasoconstriction, impair tissue perfusion, and reduce tissue-oxygen partial pressure [2]. Other responses triggered by pain include catabolic hypermetabolism resulting in hyperglycemia, lipolysis and breakdown of muscle to provide protein substrate [3] Recently, it is realized that more than 80% of the ICU-discharged hospitalized patients had painful memories and discomfort associated with the endotracheal tube, and 38% patients remembers pain as their worst intensive care memory even 6 months later. Granja et al [4] found that 17% of patients recollect experiencing severe pain 6 months after discharge and 18% were at the risk for developing posttraumatic stress disorder (PTSD). Acute pain in ICU patients is a greatest risk factor for developing, debilitating chronic, persistent, and neuropathic pain [5].

Pain assessment techniques

The following pain scales can be used in awake and cooperative patients

1) Visual analogue scale (VAS)
2) Numerical rating scale (NRS)
3) Verbal rating scale (VRS)
4) Behavioural pain scale (BPS)
5) Critical care pain observation tool (CPOT)

In our study we are using Numerical Rating Scale and Behavioural Pain Scale and Assessment. NRS was used for patients who were able to communicate and BPAS was used for patients who were not able to communicate like those who were critically ill, sedated and mechanically ventilated patients

Numerical rating scale (NRS)

Patients rate pain by describing on a 10-point scale (**Figure 1**) (0, no pain; and 10, most severe pain).

Behavioural pain scale (BPS)

It is a clinical observational score depending upon the patient's facial expressions, upper limbs posturing, and tolerance of the controlled mechanical ventilation (**Figure 2**). This score ranges from 3 to 12, and a score of >6 require pain management [6].

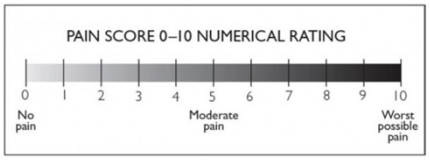

Figure 1 Numerical rating scale (NRS)

Facial expressions	Relaxed	1
	Partially tightened	2
	Fully tight	3
	Grimacing	4
Upper limbs	No movements	1
	Partially bent	2
	Fully bent with fingers flexion	3
	Permanently retracted	4
Compliance with mechanical ventilation	Tolerating movements	1
	Coughing but tolerating ventilation most of the time	2
	Fighting with ventilator	3
	Unable to control the ventilation	4

Figure 2 Behavioural pain scale (BPS)

METHODOLOGY

Type of study-
cross- sectional study, conducted in Intensive Care Unit, Saveetha Medical College and Hospital

Duration-
The data pooled from the study was conducted from January 3rd 2019 to March 31st 2019 for a period of 3 months

Sample size- 100

Inclusion criteria-
all patients above 18 years old who were admitted in intensive care unit

Exclusion criteria-
all patients below 18 years old who were admitted in intensive care unit

Sampling method- simple random sampling

Data collection tool-
Numerical Rating Scale (NRS) and Behavioural Pain Assessment Scale (BPAS) was used to assess the pain among the patients.

Data collection technique-
Documents and records and personal interview A total of 100 patients were included in the study. A special book was maintained to collect the data from the patients. All the patients were questioned or assessed by the principle investigator. Institutional Ethical clearance was obtained. informed verbal consent was obtained from the patient..

Method:
In this study, the 100 patients were divided into two categories based on the cause of the pain as follows: Pain due to medical causes and Pain due to surgical causes. In our study, the population under study which was 100 patients were also divided into three groups according to age and is given as follows: 21-50 years, 51 – 80 years and Above 80 years

NRS was used for patients who were able to communicate and BPAS was used for patients who were not able to communicate like those who were critically ill, sedated and mechanically ventilated patients.

In case if medical treatment was given for pain management, pain scores were noted before giving the medication as well as after giving the medication, to note the difference in pain scores and the treatment is considered a success if there is a reduction in the score after introducing the medication using NRS or BPAS scales depending respectively.

Another aspect of our study was to check how much pain a patient suffers due to procedures other than surgical ones like insertion of urinary catheter, hand peripheral line, external jugular vein peripheral line, internal jugular peripheral line, dialysis catheter, epidural line, central line arterial line and femoral line. Mostly all patients suffered pain due to procedures other than surgical ones and all of them were assessed for pain. Only those patients who were able to communicate that is 94 patients out of the total 100 were graded by using NRS scale and the pain score was noted. It was also noted if any medication was given or not to the patients to manage the pain caused due to these procedures and if provided with medication the pain got reduced or not was noted.

Those patients who were not able to communicate that is those graded with BPAS scale who were sedated or mechanically ventilated patients were not taken in to account on pain suffered during procedure

RESULT

As mentioned under methodology, the 100 patients were divided into two categories based on the cause of the pain as follows:Pain due to medical causes (84%) and Pain due to surgical causes (16%)

As mentioned under methodology ,the population under study which was 100 patients were also divided into three groups according to age and is given as follows: 21-50 years, 51 – 80 years and Above 80 years. In this 39% of the sample size belonged to the age group 21-50 years old, 52% belonged to 51-80 years age group and 9% belonged to age group of above 80 years old.

In this study, the total number of male population under study was 56 and the total number of female population under study was 44. Hence the male: female ratio was calculated and found to be 1.272:1.

The results are tabulated as follows:

Table 1: BPAS score for patients suffering pain due to medical causes ,Table 2 : NRS Score for patients suffering from pain due to surgical causes ,Table 3 : BPAS score for patients suffering from pain due to medical causes ,Table 4 : NRS score for patients suffering from pain due to surgical causes and Table 5 : NRS score for patients suffering from pain due to procedures other than surgical ones

Table 1: BPAS score for patients suffering pain due to medical causes

BPAS SCORE	NO OF PATIENTS	**NO OF PATIENTS GIVEN TREATMENT FOR PAIN**	TREATMENT	**AFTER TREATMENT BPAS SCORE OF PATIENT**
<6	3	**NIL**	-	**-**

Table 2 : NRS Score for patients suffering from pain due to surgical causes

NRS SCORE	**NO OF PATIENTS**	**NO OF PATIENTS GIVEN TREATMENT FOR PAIN**	**TREATMENT**	**AFTER TREATMENT NRS SCORE OF PATIENT**
0	**17**	**NIL**	**-**	**-**
1	**3**	**NIL**	**-**	**-**
2	**43**	**5**	**PARACETAMOL(4PATIENTS)**	**0 FOR 1 PATIENT**
				1 FOR 3 PATIENT
			FENTANYL(1 PATIENT)	**0**
3	**8**	**1**	**PARACETAMOL**	**1**
4	**1**	**1**	**PARACETAMOL**	**3**
5	**4**	**4**	**ASPIRIN**	**1 FOR 1 PATIENT**
				2 FOR 2 PATIENT
				3 FOR 1 PATIENT
6	**2**	**2**	**PARACETAMOL(1 PATIENT)**	**1**
			FENTANYL(1 PATIENT)	**2**
7	**3**	**3**	**ASPIRIN(1 PATIENT**	**3**
			FENTANYL(2 PATIENT)	**3 FOR 1 PATIENT**
				2 FOR 1 PATIENT

Table 3 : BPAS score for patients suffering from pain due to medical causes

BPAS SCORE	NO OF PATIENTS	**NO OF PATIENTS GIVEN TREATMENT FOR PAIN**	TREATMENT	**AFTER TREATMENT BPAS SCORE OF PATIENT**
<6	2	NIL	-	-
7	1	1	FENTANYL	4

Table 4 : NRS score for patients suffering from pain due to surgical causes

NRS SCORE	**NO OF PATIENTS**	**NO OF PATIENTS GIVEN TREATMENT FOR PAIN**	**TREATMENT**	**AFTER TREATMENT NRS SCORE OF PATIENT**
0	**1**	**NIL**	**-**	**-**
1	**0**	**NIL**	**-**	**-**
2	**4**	**NIL**	**-**	**-**
3	**3**	**NIL**	**-**	**-**

4	**2**	**1**	**PARACETAMOL**	**1**
5	**2**	**2**	**FENTANYL**	**1**
6	**1**	**1**	**FENTANYL**	**2**

Table 5 : NRS score for patients suffering from pain due to procedures other than surgical ones

NRS SCORE	NO OF PATIENTS	NO OF PATIENTS GIVEN TREATMENT FOR PAIN	TREATMENT	AFTER TREATMENT NRS SCORE OF PATIENT
0	**16**	**NIL**	**-**	**-**
1	**52**	**NIL**	**-**	**-**
2	**20**	**NIL**	**-**	**-**
3	**6**	**NIL**	**-**	**-**
MORE THAN 3	**NIL**	**NIL**	**-**	**-**

DISCUSSION

In this study , 84 patientssuffered pain due to medical reasons, out of which 47 were male and 37 were female patients. Out of the 84 patients, 3 Patients were assessed by using the BPAS scale. The pain score was found to be less than 6 in all the three cases, hence no treatment was given to manage the pain. The remaining 81 patients were assessed for pain by using the NRS scale, out of which 46 were male and 35 were female patients. Out of the 81 patients, 16 patients were given medications to relieve the pain. In this, 7 patients were treated with paracetamol, 4 patients were treated with fentanyl and 5 patients were treated with aspirin. After reassessment of pain in each of the 16 patients , the pain score was found to be reduced considerably.

In this study,16 patients suffered from pain due to surgical reasons, out of which 9 patients were male and 7 patients were female. Out of the 16 patients, 3 patients were assessed by using the BPAS scale. The pain score was found to be less than 6 in two cases, hence no treatment was given. The score of 7 was found in one patient assessed by BPAS and was treated with fentanyl. After reassessment the pain score reduced from 7 to 4 in the third patient. The remaining 13 patients were assessed by using the NRS scale, out of which 6 were male patients and 7 were female patients. Out of 13 patients, 4 patients were given medications to relieve the pain. In this , 1 patient was treated with paracetamol and 3 patients were treated with fentanyl. After reassessment of pain in each of the 13 patients, the pain score was found to be reduced considerably.

In this study, the pain score was also assessed in patients who suffered pain due to procedures for a total of 94 patients using NRS scale other than the patients scaled by BPAS scale who were sedated and mechanically ventilated patients.. The remaining 6 patients were not assessed as it was not possible to find out the exact reason of causation of the pain using BPAS scale.

Out of 94 patients, 52 patients were male and 42 patients were female. The pain score was found to be less than 4 in all the 94 patients, hence no treatment was given to these patients to relive the pain caused due to procedures.

In this study , patients who suffered pain due to medical causes, were treated with paracetamol, aspirin and fentanyl out of which paracetamol was used more than the other two drugs.
Patients who suffered pain due to surgical reasons were treated with paracetamol and fentanyl, out of which fentanyl was used more commonly than paracetamol in our study. The various uses and adverse effects of drugs used are given in table 6

TABLE 6 DRUGS GIVEN TO PATIENTS IN THIS STUDY

DRUGS	USES	DOSAGE	HALF LIFE	ADVERSE EFFECTS
Paracetamol	In fever as antipyretic and as analgesic	1 g every 6 h	2–3 h	Hypotension Hepatotoxic, nephrotoxic, nausea, vomiting, anorexia and abdominal pain.
Aspirin	As analgesic-headache, backache, neuralgias, dysmenorrhoea , pyrexia, rheumatic fever, rheumatic, psoriatic and osteoarthritis, for anti-platelet activity in post stroke and post-MI	600-650 mg	2-3 h	Drowsiness and gastric irritation, nephrotoxic, hepatotoxic , bronchial asthma.
Fentanyl	Postoperative and obstetric analgesia , chronic pain management	25–100 µg bolus 25–200 µg/h	2-5 h	Muscle rigidity, nausea, vomiting, respiratory depression, accumulation in hepatic impairment

CONCLUSION:

Even during rest intensive care unit patients are having pain which increases the chance of chronic pain and posttraumatic stress disorders. Pain can also be due to simple procedure like urinary catheter, hand peripheral line, etc., which we do in our routine practice in hospital. So the clinician shouldn't neglect the pain from these procedures, which has potential to turn into a stress disorder. Best ways to screen the patients for pain is grading of pain routinely after procedures using various pain assessment technique. This study adds to our existing knowledge the importance of screening of pain routinely for repeated time intervals in patients admitted in ICU.

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