

## BEHAVIOURAL PAIN SCALE TO ASSESS PAIN IN SEDATED AND CONSCIOUS PATIENTS

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### Abstract

**INTRODUCTION:** Pain prevalence estimates vary by population and setting, it is about 46-80% of individuals with chronic or terminal illnesses in hospital. This pain is significant to cause both physical and psychological distress, interferes with activities of daily living, predisposes to development of adverse sequelae, impairs quality of life, and ultimately delays healing and recovery. There are various barriers for effective verbal communication in these patients such as sedation, decreased level of consciousness, endotracheal intubation, and mechanical ventilation, which are limiting factors for patients self-report of pain. To report this pain, some behavioural and physical responses can be used to assess and diagnose the pain. BPS can be used to assess pain before and after the two common procedures in unconscious ICU-admitted patients and it was reported to be a valid and reliable tool in evaluation of the pain of unconscious patients.

**MATERIAL AND METHODS:** patients admitted to the ICU were evaluated for inclusion in the study once a day. Patients who were above 18 years, sedated, and ventilated for at least 8 h before assessment were included in the study. Measurement of pain by BPS scale was done by 2 observers and was recorded. Written informed consent from the patient's relatives was obtained. Pain ranking is from 3 to 12, and the patient's status considered based on this scale is painless as 3, mild from 4–6, moderate from 7–9, or severe if ranged between 10–12 pain. The scores of 6 and higher indicate moderate-to-severe pain.

**RESULTS:** In present study 100 patients were included. 71% patients were sedated state on all days while 18% cases were in consciously sedated state on all days and 11% patients were either in sedated or conscious sedated state on different days. 59.1% cases were male among those who were in sedated state on all days, where as 66.7% and 63.6% were males among those who were in conscious sedated state on all days and in either state on different days respectively. The amount of protocol administered was  $128.9 \pm 55.3$  mg/hr for conscious sedated patients whereas it was  $172.3 \pm 72.6$  mg/hr for sedated patients ( $P < 0.05$ ). The difference was observed to be statistically significant. The amount of midazolam given to conscious sedated patients and sedated patients was  $2.9 \pm 1.8$  vs  $3.8 \pm 2.3$  mg/hr ( $P = 0.12$ ). Total BPS in conscious sedated patients during rest was  $3.7 \pm 0.5$  and during painful procedure was  $5.2 \pm 1.1$  this was highly significant. BPS facial expression during painful procedures Facial expression BPS was  $2.4 \pm 0.9$  and during rest it was  $1.0 \pm 0.2$ . It was highly significant.

**CONCLUSION:** For conscious sedated patients the BPS system can be validly and reliably used during painful procedures. BPS is a sensitive scale for capturing changes in pain response and discriminates between painful and nonpainful procedures.

### Introduction:

Pain is a subjective and multidimensional sensory and emotional experience related to actual or potential tissue damage.<sup>i</sup> Pain prevalence estimates vary by population and setting, it is about 46-80% of individuals with chronic or terminal illnesses in hospital. This pain is significant to cause both physical and psychological distress, interferes with activities of daily living, predisposes to development of adverse sequelae, impairs quality of life, and ultimately delays healing and recovery<sup>ii</sup>. There are various barriers for

effective verbal communication in these patients such as sedation, decreased level of consciousness, endotracheal intubation, and mechanical ventilation, which are limiting factors for patient's self-report of pain<sup>iii, iv</sup>. To report this pain, some behavioral and physical responses can be used to assess and diagnose the pain. These behavioral and observational scales of pain measurement include the critical-care pain observation tool (CPOT), nonverbal pain scale (NVP), behavioural pain scale (BPS), comfort scale, FACES i.e. face, legs, activity, cry scale,

consolability scale, and pain assessment behavioral scale with numeric rating scale<sup>v</sup>.

BPS can be used to assess pain before and after the two common procedures in unconscious ICU-admitted patients and it was reported to be a valid and reliable tool in evaluation of the pain of unconscious patients. BPS scale was compared with observational evaluation of pain in ICU, and it was seen that the pain score measured by BPS scale compared with observational evaluation was significantly higher<sup>vi, vii</sup>.

Current Intensive care unit (ICU) practices restrict sedation to a conscious level whenever possible, according to the landmark report<sup>viii</sup>. Pain assessment is difficult in those patients who are unable to self-report their pain, and due to which pain score is underestimated in critically ill non-communicative patients. Untreated prolonged pain could have detrimental effects on many body organ systems and

result in chronic pain<sup>ix</sup>. So, pain assessment tools that focus mainly on behavioural indicators of pain should be used in this group of patients to assess the pain.

## MATERIAL AND METHODS

This prospective observational study was conducted in the department of Anaesthesia in Venkateshwara Institute of Medical Science, Gajraula (UP).

During the study period all patients admitted to the ICU were evaluated for inclusion in the study once a day. Patients who were above 18 years, sedated, and ventilated for at least 8 h before assessment were included in the study. Patients on muscle-paralyzing drugs, unconscious after resuscitation, had a critical illness or with epidural catheter were excluded from the study. 100 patients were included in the study who fulfilled the criteria.

**Table 1: Behavioral Pain Scale<sup>x</sup>.**

Item	Description	Score
Facial expression	Relaxed	1
	Partially tightened	2
	Fully tightened	3
	Grimacing	4
Upper limbs	No movement	1
	Partially bent	2
	Fully bent with finger flexion	3
	Permanently retracted	4
Compliance with ventilation	Tolerating movement	1
	Coughing but tolerating ventilation for most of the time	2
	Fighting ventilator	3
	Unable to control ventilation	4

In BPS three main parts of face status, movement of upper limb, and moaning in the non-incubated patients/patients under mechanical ventilation was seen. Pain ranking is from 3 to 12, and the patient's status considered based on this scale is painless as 3, mild from 4–6, moderate from 7–9, or severe if ranged between 10–12 pain. The scores of 6 and higher indicate moderate-to-severe pain, for which treatment is required. Measurement of pain by BPS scale was done by 2 observers and was recorded. Written informed consent from the patients' relatives was obtained.

## Data Analysis

All data was recorded and entered in Microsoft Excel sheet. Statistical analysis was done using the SPSS

software and was performed by calculation on all measurements of all patients, including 1 measurement per day per patient. .

## RESULTS

In present study 100 patients were included. 71% patients were sedated state on all days while 18% cases were in consciously sedated state on all days and 11% patients were either in sedated or conscious sedated state on different days. 59.1% cases were male among those who were in sedated state on all days, where as 66.7% and 63.6% were males among those who were in conscious sedated state on all days and in either state on different days respectively.

**Table 2: Characteristics of patients in sedated state, conscious sedated state or in both state.**

	Patients in sedated state on all days	Patients in conscious sedated state on all days	Patients in both states on different days
<b>Number of patients</b>	71	18	11
<b>Age (Years) mean <math>\pm</math>SD</b>	64.2 $\pm$ 13.7	60.5 $\pm$ 14.2	59.3 $\pm$ 10.6
<b>Male</b>	42	12	7
<b>Female</b>	21	6	4
<b>SOFA score (range)</b>	6(1 - 12)	5(1 - 10)	5(2 - 9)
<b>Diagnostic categories (n)</b>			
<b>Cardiac surgery (%)</b>	30 (42.3%)	10 (55.6%)	2 (18.2%)
<b>Abdominal surgery (%)</b>	12 (16.9%)	5 (27.8%)	4 (36.4%)
<b>Other surgeries (%)</b>	7 (9.9%)	1 (5.6%)	0 (0%)
<b>Nonsurgical (%)</b>	22 (9.9%)	2 (11.1%)	5(45.5%)
	71	18	11
<b>SOFA Sequential Organ Failure Assessment; SD: Standard deviation</b>			

The amount of protocol administered was 128.9 $\pm$  55.3 mg/hr for conscious sedated patients whereas it was 172.3 $\pm$  72.6 mg/hr for sedated patients ( $P < 0.05$ ). The difference was observed to be statistically significant. The amount of midazolam given to conscious sedated patients and sedated patients was 2.9  $\pm$  1.8 vs 3.8  $\pm$  2.3 mg/hr ( $P = 0.12$ ).

The ICU stay on average ( $\pm$ SD) at time of pain assessment was 5.7 $\pm$  7.6 for sedated patients vs 4.2  $\pm$  3.3 for conscious sedated patients ( $P = 0.41$ ).

**Table 3: Pain score by BPS in Sedated conscious patients during rest and procedure**

Conscious sedated patients	During rest	During painful procedure	P value
Total BPS	3.7 $\pm$ 0.5	5.2 $\pm$ 1.1	< 0.0001
Facial expression BPS	1.0 $\pm$ 0.2	2.4 $\pm$ 0.9	< 0.0001
Upper limb movement BPS	1.6 $\pm$ 0.7	2.1 $\pm$ 0.9	0.0715
Compliance ventilation BPS	1.5 $\pm$ 0.5	1.9 $\pm$ 0.6	0.0369

Total BPS in conscious sedated patients during rest was 3.7  $\pm$  0.5 and during painful procedure was 5.2 $\pm$ 1.1 this was highly significant. BPS facial expression. During painful procedures Facial expression BPS was 2.4 $\pm$ 0.9 and during rest it was 1.0 $\pm$ 0.2. It was highly significant. Upper limb movement BPS in rest was 1.6 $\pm$ 0.7 and during painful procedure was 2.1 $\pm$ 0.9,  $P = 0.0715$ . Compliance ventilation BPS during rest was 1.5 $\pm$ 0.5 and during painful procedure was 1.9 $\pm$ 0.6 ( $P = 0.0369$ ).

#### DISCUSSION:

BPS is used to assess pain severity in critically ill patients and this study was aimed to evaluate the use of BPS in detecting pain among conscious sedated hospitalized patients.

Our study showed that BPS in conscious sedated patients during rest was 3.7  $\pm$  0.5 and during painful procedure was 5.2 $\pm$ 1.1 this was highly significant. In a study by Gomarverdi S et al demonstrated that there was increase in pain score from resting to turning or suctioning of endotracheal secretions. Also they demonstrated the same results with Critical care pain observational tool (CPOT) scale<sup>xi</sup>. Payen et al.<sup>13</sup> in their study also made a similar observation in deeply

sedated patients and their BPS scores were significantly higher for painful procedures such as turning or tracheal suctioning. Therefore, it would seem that the BPS can detect and discriminate pain and is a valid measure of pain in both sedated and conscious sedated patients<sup>xii</sup>.

BPS facial expression during painful procedures Facial expression BPS was  $2.4 \pm 0.9$  and during rest it was  $1.0 \pm 0.2$ . It was highly significant in our study. Similar results were seen by Aissaoui Y et al that the BPS subscale facial expression, was the most sensitive to change, in their study BPS was internally reliable, validity was demonstrated by the change in BPS scores, which were significantly higher during painful procedures, with averages of  $3.9 \pm 1.1$  at rest and  $6.8 \pm 1.9$  during procedures ( $P < 0.001$ )<sup>xiii</sup>. In a study on critically ill ICU patients BPS score was significantly increased at the same time and in their study they mentioned that the increase in BPS score during presumed nonpainful procedure such as oral care may be related more on a touch reflex rather than pain<sup>xiv</sup>.

## CONCLUSION

For conscious sedated patients the BPS system can be validly and reliably used during painful procedures. BPS is a sensitive scale for capturing changes in pain response and discriminates between painful and nonpainful procedures.

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