

The Critical-Care Pain Observation Tool: A Useful Tool for Pain Assessment in Intensive Care Units

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ABSTRACT

Pain is a major concern in all intensive care units (ICUs). The proper assessment and management of pain is one of the main goals of patient care in ICUs. Improper evaluation of pain and its over or under treatment can cause significant problems in the process of patient management in ICU. Since most ICU patients are unable to communicate correctly with the ICU team and explain their level of pain, pain assessment can be challenging. Thus, several assessment tools for the evaluation of pain were developed, few of which were validated. Critical Care Pain Observation Tool is a valid and reliable instrument for pain assessment in different ICUs.

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Introduction

Pain is a major concern in intensive care units (ICUs). It has been reported that nearly 50% of ICU patients suffer from moderate to severe pain (1). Different factors are involved in inducing pain including immobility, medical procedures, traumatic injuries, infection, and wound care (2, 3). The proper management of pain in ICU is one of the main goals of treatment since poor pain management can contribute to a variety of adverse medical outcomes including prolonged ICU stay, chronic pain, post-traumatic stress disorder, pulmonary complications, insufficient sleep, and thromboembolic events (3-6). In general, pain may increase morbidity and mortality after ICU admission and lower the health-related quality of life in patients (7). Obviously, improvement in pain management can reduce morbidity and mortality rates and enhance survival (3).

The first step in pain relief is proper pain measurement (8). On the other hand, the proper assessment of pain in ICU may be complicated by several factors that hamper the communication of patient with ICU team including level of consciousness, mechanical ventilation, severity of the underlying disorder, and the use of sedatives (8-10). Inappropriate pain management in ICU can result in under or over treatment of the problem, each of which can cause serious complications. Under treatment of pain can prolong weaning of mechanical ventilation and ICU stay and increase pulmonary complications, violence toward the ICU team, pain-related immunosuppression, and patient-ventilator asynchrony (11). Conversely, over treatment of pain in ICU can raise the need for mechanical ventilation, cognitive impairment, delirium, respiratory depression, circulatory depression,

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urinary retention, and bowel movement abnormalities (11). Therefore, the accurate assessment and management of pain in ICU is one of the fundamentals of ICU care. Although the most valid ways of pain measurement are based on patient's self-report (3), different factors may hamper patients to communicate and express their level of pain. The most important of these factors are intubation and mechanical ventilation, sedation, and the underlying condition (3,12).

In nonverbal patients, it is strongly recommended that behavioral and physiologic indicators be applied for the assessment of pain (3, 13, 14). A vast array of studies was performed to validate the behavioral and physiological indicators (8). However, there are few valid tools for the evaluation of pain in ICU (3).

The pain assessment tools in ICU

As mentioned before, there are few valid pain assessment tools in ICU. The adult Non-Verbal Pain Scale (NVPS) was first proposed for critical care burns unit and for mechanically ventilated or sedated patients (3, 15). NVPS consists of five categories: facial movement, body movement, guarding, physiological I (i.e., blood pressure, heart rate, and respiratory rate), and physiological II (i.e., dilated pupils, flushing, diaphoresis, and pallor). Scores 0 to 2 are considered for each category. The Behavioral Pain Scale (BPS) and the Critical Care Pain Observation Tool (CPOT) are two valid and evidence-based tools for the assessment of pain in ICU and are recommended by guidelines for the management of pain in ICU (13, 14, 16).

The Critical Care Pain Observation Tool (CPOT)

The CPOT is a valid pain assessment tool developed by Gelinas et al. (8) for measuring the behavioral indicators of pain in ICU patients who are not able to communicate (8, 16).

The behavioral indicators are as follows (8):

- Facial expression: this indicator is one of the best parameters for pain assessment. The scores for this item may be 0 (no muscle tension), 1 (tense face exhibited as frowning or brow lowering), and 2 (grimacing).
- Body movements: this parameter can be scored 0 to 2. A score of 0 is assigned to a patient without movement ability or a patient that remains in normal position, score 1 refers to protective movement, and score 2 is given to restless or agitated patients.
- Compliance with the ventilator (in mechanically ventilated patients)/ vocalization (in non-intubated patients): compliance with the ventilator is assigned scores 0 (easy ventilation with no alarm or coughing), 1(coughing or activating alarm that stops

without the ICU team's intervention), and 2 (fighting with the ventilator). Vocalization is used in non-intubated patients with the scores 0 (absence of sound or normal speech), 1 (sighing or moaning), and 2 (crying out).

- Muscle tension: this parameter is evaluated by performing passive extension and flexion.

For this purpose, scores 0 (no resistance during movements or turning), 1 (resistance during movements or turning), and 2 (strong resistance) are assigned.

The role of the CPOT in the assessment of pain in ICU

The first study by Gelinas et al. showed that the CPOT is a valid tool for pain assessment and shows higher scores during painful procedures (8). The CPOT has been validated in several adult critical care settings including medical, trauma, and postoperative ICUs (3, 8, 17-19).

The CPOT has been significantly correlated with patients' self-report of pain that accentuates the validity of this tool (8). It must be noted that behavioral pain scales clarify the presence of pain not its intensity (20). The CPOT is an easy and applicable tool for the assessment of pain in ICU. This instrument has been translated into different languages around the world, and with documentation of its validity and reliability, it is effectively used in critical care practice.

Conclusion

Since proper detection and management of pain is crucial in critical care settings, it is necessary that valid and reliable tools be applied for this purpose. The CPOT is a valid tool for pain assessment and can be easily applied in different ICU settings.

Acknowledgments

None.

Conflict of Interest

All the authors declare no conflicts of interest.

References

1. Stanik-Hutt JA, Soeken KL, Belcher AE, Fontaine DK, Gift AG. Pain experiences of traumatically injured patients in a critical care setting. *Am J Crit Care.* 2001; 10:252-9.
2. Payen JF, Bosson JL, Chanques G, Mantz J, Labarere J. Pain assessment is associated with decreased duration of mechanical ventilation in the intensive care unit: a post hoc analysis of the DOLOREA study. *Anesthesiology.* 2009; 111:1308-16.
3. Topolovec-Vranic J, Gelinas C, Li Y, Pollmann-Mudryj MA, Innis J, McFarlan A, et al. Validation and evaluation of two observational pain assessment tools in a trauma and neurosurgical intensive care unit. *Pain Res Manag.* 2013; 18:e107-14.
4. Malchow RJ, Black IH. The evolution of pain

- management in the critically ill trauma patient: Emerging concepts from the global war on terrorism. *Crit Care Med.* 2008; 36:S346-57.
5. van GL, Ahlers SJ, Brkic Z, Belitser SV, van Boven WJ, van Dongen EP, et al. Improved analgesia after the realisation of a pain management programme in ICU patients after cardiac surgery. *Eur J Anaesthesiol.* 2010; 27:900-5.
 6. Rijkenberg S, van der Voort PH. Can the critical-care pain observation tool (CPOT) be used to assess pain in delirious ICU patients? *J Thorac Dis.* 2016; 8:E285-7.
 7. Ahlers SJ, van Gulik L, van der Veen AM, van Dongen HP, Bruins P, Belitser SV, et al. Comparison of different pain scoring systems in critically ill patients in a general ICU. *Crit Care.* 2008; 12:R15.
 8. Gélinas C, Fillion L, Puntillo KA, Viens C, Fortier M. Validation of the critical-care pain observation tool in adult patients. *Am J Crit Care.* 2006; 15:420-7.
 9. Kollef MH, Levy NT, Ahrens TS, Schaiff R, Prentice D, Sherman G. The use of continuous i.v. sedation is associated with prolongation of mechanical ventilation. *Chest.* 1998, 114:541-8.
 10. Kress JP, Pohlman AS, O'Connor MF, Hall JB. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. *N Engl J Med.* 2000; 342:1471-7.
 11. Hajiesmaeili MR, Safari S. Pain management in the intensive care unit: do we need special protocols? *Anesth Pain Med.* 2012; 1:237-8.
 12. Juarez P, Bach A, Baker M, Duey D, Durkin S, Gulczynski B, et al. Comparison of two pain scales for the assessment of pain in the ventilated adult patient. *Dimens Crit Care Nurs.* 2010; 29:307-15.
 13. Herr K, Coyne PJ, McCaffery M, Manworren R, Merkel S. Pain assessment in the patient unable to self-report: position statement with clinical practice recommendations. *Pain Manag Nurs.* 2011; 12:230-50.
 14. Barr J, Fraser GL, Puntillo K, Ely EW, Gélinas C, Dasta JF, et al. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. *Crit Care Med.* 2013; 41:263-306.
 15. Odhner M, Wegman D, Freeland N, Steinmetz A, Ingersoll GL. Assessing pain control in nonverbal critically ill adults. *Dimens Crit Care Nurs.* 2003; 22:260-7.
 16. Ribeiro CJN, de Araújo ACS, Brito SB, Dantas DV, Nunes MDS, Alves JAB, et al. Pain assessment of traumatic brain injury victims using the Brazilian version of the Behavioral Pain Scale. *Rev Bras Ter Intensiva.* 2018; 30:42-9.
 17. Gélinas C, Johnston C. Pain assessment in the critically ill ventilated adult: validation of the critical-care pain observation tool and physiologic indicators. *Clin J Pain.* 2007; 23:497-505.
 18. Gélinas C, Fillion L, Puntillo KA. Item selection and content validity of the critical-care pain observation tool for non-verbal adults. *J Adv Nurs.* 2009; 65:203-16.
 19. Gélinas C, Tousignant-Laflamme Y, Tanguay A, Bourgault P. Exploring the validity of the bispectral index, the Critical-Care Pain Observation Tool and vital signs for the detection of pain in sedated and mechanically ventilated critically ill adults: a pilot study. *Intensive Crit Care Nurs.* 2011; 27:46-52.
 20. Assessing pain in the critically ill adult. *Crit Care Nurse.* 2014; 34:81-3.