Non-Verbal Pain Assessment: A Literature Review

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ABSTRACT

Pain is influenced by multiple factors including personal experience, psychological, sociocultural and situational factors. Failure to recognise pain will lead to poor patient management and deleterious effect on the patients' wellbeing. Assessing pain in paediatric and cognitively compromised patients remains a challenge. Pain assessment in these groups of patients depends on the observers' assessment and studies have shown the discrepancy between the observers' assessment and patients' verbal report. A specific and accurate tool is required to assist in the pain assessment. Although there are assessment tools available using behaviour scoring system and physiological indicators, none of the tool demonstrates its superiority than the others. Biochemical indicators such as stress hormones are frequently measured and used in con-junction with verbal reports; however they are non specific to pain and are increased in inflammation, haemodynamic and emotional changes. The association between immunological indicators e.g. IL-1 , IL-6, IL- 8 and clinical pain has been shown, however; the definite correlation of the changes in the indicators and the level of pain is still unclear and may require further investigation.

KEYWORDS: Pain, assessment, immunological indicators

INTRODUCTION

The International Association for the Study of Pain has defined pain as unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.1 Pain is a complex phenomenon and it is influenced by multiple factors including personal experience, psychological, sociocultural and situational factors.[2] There are three major psychological dimensions of pain including sensory discriminative, motivational affective and cognitive-evaluative components that interact with one another to provide perceptual information on the location, magnitude, and spatiotemporal properties of the noxious stimuli, motivational tendency toward escape or attack, and cognitive information based on past experience and probability of outcome of different response strategies.[3,4]

It is crucial for a physician to assess pain in a patient and properly manage the symptom. Failure to recognize pain and address the problem will lead to poor patient care. The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) has recognized the right of individual patients to have a proper management of pain.[5] One of the important barriers to appropriate pain management includes inadequate pain assessment. The tools available to assess pain e.g. include visual analogue scale (VAS), Numeric Rating Scale (NMR), Verbal Descriptor Scale (VDS), PAULA the pain meter and McGill Pain Questionnaire (MPQ).[3,6,7]

Assessing pain is extremely difficult, especially if the person is unconscious or has intellectual disability or lacks the ability to communicate verbally e.g. too young.[8,9] The present assessment tools e.g. VAS may not be suitable for use among the elderly patients and development of a pain assessment tool in these patients remains a challenge.[4] Pain measurement in these groups of patients may depend on the observers' assessment and might not be accurate.

Nurses' assessments of patients' pain intensity

Reports have shown that the mean scores of nurses/ medical care providers were lower compared to the recorded patients' pain intensity in the hospital settings; cardiac wards,[2] Emergency Department,[10] perinatal unit mid labour, and delivery unit.[11] A report by Zalon in 1993 has shown that the nurses underestimated the severe pain and overestimated the mild pain in patients who have undergone abdominal surgery.[12] Rundshagen et al, demonstrated that the discrepancies in pain estimates between patients and nurses increased with the level of pain.[13] In another report that compared the pain assessment between triage nurse, child and parent at a tertiary referral emergency department, it was observed that the nurses assigned significantly lower pain score compared to the children and the parents.[14]

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Factors that may affect nurses' assessment and management of pain include inadequate skills, knowledge, attitudes and beliefs about pain, its assessment and management and the nurses' experience.[15] Assessment of patients' pain intensity is an important aspect in providing effective pain management. An appropriate pain assessment is necessary to provide adequate treatment to achieve pain reduction, increase in comfort and improve function. Medical providers play a vital role in pain assessment and management therefore they need a specific and accurate method for pain assessment.

Pain sensation in paediatric patients

Reports have shown that children are frequently undertreated for their pain compared to adults.[16,17] It is important for the medical care providers to appreciate that children and even infants can feel pain at least as adults do. The nociceptive pathways and neurotransmitters that are involved in pain transmission developed early in the gestational life and the development continues postnatally.[18,19] It was reported that a human fetus might feel pain in utero and the nociceptive system is functioning in infants.[20,21] A report by Simmons and Tibboel has shown that the descending inhibitory pathways and the cortical pain memory system are not fully developed in neonates.[22] These factors might lead to an enhanced pain sensation in the infants; however, the pain response might be different from an adult whose nervous system has fully developed.

A report by Johnston et al, demonstrated that 20% of preterm infants in the neonatal intensive care unit have not shown a pain behavioural response following a heel lance procedure.[23] The authors have noted that the greatest predictor of decreased behavioural response to pain was the number of painful procedures that the infants had undergone. Another report has shown that full term newborn babies who had undergone circumcision without analgesia had increased the pain response evaluated during vaccination shots done a few months after the circumcision.[24] The painful procedures in preterm babies may interrupt the progress of behavioural development and these babies had a greater tendency to somatise at a later age (4.5 years old).[23,25] Wollgarten-Hadamek et al, showed that burn injuries in infancy induced long term alteration in sensory and pain processing and the alteration was observed when the children were in the school aged group (9 to 16 years).[26] This emphasizes the necessity to accurately assess pain in infants and provide adequate analgesia during the medical intervention or injury.

Paediatric pain assessment

When a child is not able to give a verbal report of pain, it is necessary to assess pain through behavioural observation and evaluate certain physiological indicators. The behavioural indicators include facial expression and cry and studies have shown that facial expression can be utilised to gauge the intensity of pain in infants.[27,28] The physiological indicators include the increased in heart rate, blood pressure, respiratory rate and decreased in oxygen saturation.[29,30] The changes in the physiological indicators are similar to responses in other stressful condition and therefore have to be interpreted with caution to prevent under assessment or over assessment. Few scales utilising the behavioural and physiological indicators include Premature Infant Pain Profile (PIPP), Neonatal Facial Coding Scale (NFCS), Neonatal Infant Pain Scale (NIPS), CRIES Score and Scale for Use in Newborns (SUN).[31,32] The parents or caretakers of the child should be encouraged to participate in the child's pain assessment and management as their assessment might be more correlated with the degree of pain complaint by the patient.[14] However, Zhou et al, reported that the parents' perception of the child's pain should be regarded as an estimation of the pain experienced by the child and not the same as the child's self report.[33]

Older children are capable of expressing the intensity of their pain. Pre-school children who have limited speech are able to indicate the presence of pain however; they may not express their pain verbally to a stranger in a hospital environment.[34] The verbal reports of pain may also be affected by their perception of the desirable or undesirable consequences of the rating.[35] Getting and interpreting the children's behaviour may require patience and skill from the medical care providers. Self-reporting pain assessment tools can be employed to rate and quantify the level of pain in school aged children.[36] The rating scales used will depend on the age and the communication ability of the children. The given ratings together with observed behavioral indicators might provide an accurate pain assessment. A teenager's behaviour may also be influenced by the presence of her/his peers and parents. A report has shown that higher levels of parental protective behavior were associated with higher levels of disability and somatic symptoms in the teenagers (12-17 years old) with chronic pain.[37] Often a private interview is necessary to get a more accurate picture of the patient's pain.

Pain assessment in cognitively compromised patients
Pain assessment that involves patients' verbal report of pain is not suitable for cognitively compromised patients. These patients are not able to generate the pain ratings because of short term memory loss or impairment in the language skills.[38] It was demonstrated by Scherder & Bouma that the percentage of elderly patients with midstage dementia that comprehended the Faces Pain Scale (FPS) and the Facial Affective Scale (FAS) was low in comparison to the percentage for the non-demented elderly persons.[39] Another report has shown that cognitively impaired nursing home residents are prescribed and administered significantly less analgesic medication, compared to their more cognitively intact peers.[40] Although, this can be due to reduced need of analgesia by the cognitively impaired residents, other contributing factor that lead

to alteration in the affective component of pain may result in failure to express pain verbally and inability to exhibit pain behaviour, thus the pain assessment in this special group may rely totally on the nurses or caretakers' observation.[41,42] However, pain assessment is often poorly done and made by inexperienced nurses.[42] The pain assessment in this group of patients will depend on the nurses' ability to detect pain cues inferences e.g. changes in the person's behaviour or clustering pain cues.[43]

The use of non-verbal indicators to accurately assess pain in this group of patients has been extensively investigated. Facial action coding system (FACS) is one of the tools identified to quantify pain in the cognitive compromised patients. Discrete facial action units (AUs) involving specific muscles or groups of muscles, such as brow raise, brow lower, upper lip raise, lip stretch, or mouth stretch are characteristics that are assessed and looked for in the patients.[44] Changes in facial expression have been shown to be a useful measure to identify pain in both the cognitively intact and cognitively impaired older patients.[44] However others have reported that various type of assessment tools e.g. self-report and nonverbal measures, should be employed to assess pain in the cognitively compromised patients as each of the tool contributed different information to the pain assessment.[45]

A few scales that are developed in order to assess the cognitively compromised patients include Facial Action Coding System (FACS),[45] Checklist of Nonverbal Pain Indicators (CNPI),[38] Discomfort Scale-Dementia of Alzheimer Type (DS-DAT),[46] Pain Assessment in Advanced Dementia Scale (PAINAD),[47] Pain Assessment Tool in Confused Older Adults (PATCOA),[48] Pain Assessment for the Dementing Elderly (PADE)[49] and Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC).[50] These instruments were assessed by van Herk et al, based on their reliability, validity, feasibility and utility and the report has shown that FACS, the PACSLAC, the DS-DAT, and the PAINAD show promising outcomes, however, the tools do not provide cut off point in deciding whether interventions to alleviate pain are required.[51]

Pain assessment using biochemical indicators

Biochemical indicators are frequently measured and used in con-junction with verbal reports and physiological indicators when assessing pain. Stress response hormone levels are frequently used to assess the analgesic efficacy of a drug or an anaesthetic technique and they are frequently used when pain assessment is difficult or unreliable.[50-52] The biochemical indicators that are frequently measured during the perioperative period include glucose, catecholamines, cortisol and lactate. Reports have shown that the level of the indicators was reduced when the analgesic drug or the analgesic technique was effective.[52-55] However, the increase in stress hormone postoperatively, is not solely due to pain and other factors such as inflammation, hemodynamic changes, emotional factors e.g. anxiety might play a role in the increase in the hormonal level.[56,57]

Other substances that have been measured include triacylglyceroles, HDL-cholesterol and beta-lipoproteins in pancreatitis and fracture, vitamin B6, C-reactive protein and erythrocyte sedimentation rate in rheumatoid arthritis and B-type natriuretic peptide (BNP) in myocardial stress.[58-60] Other reports have shown the association between immunological indicators e.g. IL-1 , [61], IL-6, IL- 8 and clinical pain.[62] However, the definite correlation of the changes in the indicators and the pain intensity are still unclear and may require further investigation.

CONCLUSION

Appropriate pain assessment is necessary to ensure proper management, optimum comfort and optimum function. Pain assessment in paediatric and cognitively compromised patients remains a challenge. Although there are pain assessment tools available, but none of the tool demonstrates its superiority than the others. The assessment tools should have a cut off point for necessary intervention. Biochemical indicators that are measured in con-junction with verbal reports of pain and physiological indicators are useful in pain assessment. Further study is still required to identify a suitable indicator that can be used for pain assessment universally.

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