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Systematic Review of Pain assessment scales in newborns under maxillofacial surgery Admitted to the surgical ward

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ABSTRACT

Having standard tools for measuring pain in infants is essential. The aim of this study is to review the scale of pain in newborns under maxillofacial surgery Admitted to the surgical ward. Integrative review study of articles published from 2000 to 2015, carried out in the following databases: Scopus, PubMed, CINAHL, LILACS, Cochrane, medscape and google scholar. The sample consisted of 17 articles. MeSH headings searched included pain measurement, pain scale, newborn pain, infant pain scale, maxillofacial surgery and pain perception. 16 neonatal pain assessment tools were found. Of the 232 original articles, 17 review articles in the field of pain assessment tools in infant under maxillofacial surgery who had inclusion criteria were selected. The most studied was the Premature Infant Pain Profile (PIPP), The CRIES and the Neonatal Infant Pain Scale (NIPS). Infant pain assessment is not universally standardized. Practitioners may assess pain; however, they may not consistently use the same criteria to do so. The use of Neonatal Facial Coding System, the Neonatal Infant Pain Scale and the Premature Infant Pain Profile Can accurately show the amount of pain in newborns.

Keywords: Pain assessment scale, newborn, surgical ward.

INTRODUCTION

Infant and Neonates who admitted to maxillofacial surgery ward may experience pain as the result of diagnostic, therapeutic interventions or a result of a disease process [1,2]. Therefore it is recommended the use of validated tools for pain assessment in neonate or infant, especially critically ill them [3,4]. Although no specific pain scale has demonstrated its superiority as a reliable scale and gold standard yet [5,6]. By recognizing behavioural and physiological responses to pain, adequate pain management can be provided [7,8]. Stress caused by the hyperactivity of the sympathetic pain, followed by increased heart rate, peripheral vascular resistance, blood pressure and cardiac output, and tissue ischemia. Alkalosis due to rapid and shallow breathing, bronchiectasis and lung atelectasis due to insufficient expansion, loss of fluids and electrolytes resulting in rapid breathing, increased

sweating and speed metabolism and psychological effects of future nightmares about maxillofacial surgery pain [9-11]. That is why, according to neonatal pain management in recent years significantly increased [12,13]. Therefore, to assess the severity of pain, the use of pain assessment tools are useful, for a simple and effective way to express their pain, have placed it [14]. Since the Pain assessment is considered as the 5th vital sign [15,16] and the role of pain intensity is very calm the newborn, Unfortunately these tools are always constantly and will not be used in medical environments [17-20], so the researchers decided to study with the aim of review the scale of pain in newborns under maxillofacial surgery Admitted to the surgical ward.

MATERIALS AND METHODS

A systematic literature review was conducted that focused on tools developed for neonatal pain assessment using the following databases Scopus, PubMed, CINAHL, LILACS, Cochrane, medscape and google scholar. The medical subject heading term used was: pain measurement, pain scale, newborn pain, infant pain scale, maxillofacial surgery and pain perception. Of the 232 original articles, 17 review articles in the field of pain assessment tools in infant who had inclusion criteria were selected that all studies conducted in the last 15 years (2000-2015).

Inclusion criteria: study available electronically in the selected databases in English only; which analyzed the psychometric characteristics of tools used for pain assessment in newborns, and that were published from 2000 to 2015. All ethical issues regarding the proper use of articles extracted and conditions of the release effect was observed.

RESULTS AND DISCUSSION

Of the 232 original articles, 17 review articles in the field of pain assessment tools in infant under maxillofacial surgery who had inclusion criteria were selected that 29 neonatal pain assessment tools were found that Some of them were rarely used But about 16 had the most pain assessment tools that include:

The Pain Rating Scale (PRS), Riley Infant Pain Scale (RIPS), Maximally Discriminative Facial Movement Coding System (MAX), The Children's Hospital of Eastern Ontario Pain Scale, The CRIES, Neonatal Pain and Discomfort Scale, Clinical Scoring System (CSS), Modified Behavioral Pain Scale (MBPS), Facial Action Coding System (FACS), Children's and Infants' Postoperative Pain Scale (CHIPPS), Behavioral Pain Score, Acute Pain Rating Scale for Neonates, Mills Infant/Toddler Pain Index (Mills), Neonatal Facial Coding System (NFCS), Neonatal Infant Pain Scale (NIPS) and Premature Infant Pain Profile (PIPP). But the most studied was the Premature Infant Pain Profile (PIPP), The CRIES and the Neonatal Infant Pain Scale (NIPS).

Table 1: Pain Scale, Population Tested and Validity

Pain Scale	Population Tested and Dimensions	Validity/Reliability
The CRIES	• pilot study of 20 neonates postoperatively • Posture/tone, sleep pattern, expression, color, cry, respirations, heart rate, saturations, blood pressure, nurse's perception	• Discriminant validity (limited reporting of statistics but trend toward differences in pain that would be expected between infusion started with or without bolus dose) • Content validity (scores reflecting nurses' perceptions of pain).
The Neonatal Infant Pain Scale (NIPS)	• 38 preterm and term infants and 90 procedures observed • Facial expression, cry, breathing patterns, arm movement, leg movement, and state of arousal	• Interrater reliability (Pearson's correlations 0.92 to 0.97) • Internal consistency (Cronbach's alphas 0.87 to 0.95) • Content validity (survey) • Concurrent validity (correlations 0.53 to 0.84 when compared with visual analogue scale) • Construct validity (change in pain scores over time was seen with main effect of time being statistically significant, $F = 18.97$, $P < 0.001$)
The Premature Infant Pain Profile (PIPP)	• 4 data sets (n = 27, 39, 48, & 124) of infants ranging in gestation from 28 to 40 weeks • Gestational age, behavioral state, heart rate, oxygen saturation, brow bulge, eye squeeze, and nasolabial furrow.	• Internal consistency (correlation coefficients for individual items 0.59 to 0.76; the standardized item alpha for 6 of the items was 0.71) • Content validity (experts and literature) • Construct validity (scores between no pain and pain situations, paired *t*-test = 12.24, two-tailed $P < 0.0001$)

The physiologic indicators that were included in the PIPP were chosen based on their reported consistency. Each indicator is evaluated on a 4-point scale consisting of 0, 1, 2, and 3. A total score of 6 or less generally indicates

minimal or no pain, whereas scores of greater than 12 indicate moderate to severe pain. The PIPP has instructions for use and training at the bedside and takes approximately 1 minute to review, plus 2 to 3 minutes of practice.

The CRIES is a multidimensional assessment tool that focuses on postoperative pain in infants. The CRIES assesses crying, oxygen requirement to maintain a saturation >95%, increased blood pressure and heart rate, expression and sleep state. Individual dimensions are scored from 0 to 2. A total score is calculated ranging from 0 to 10, with a higher score indicating increased pain.

The NIPS is also a multidimensional assessment tool for determining procedural pain and requires assessment of facial expression, cry, breathing patterns, arm movement, leg movement, and state of arousal. The NIPS has limited reporting of clinical utility despite its psychometric property testing.

CONCLUSION

3 of the existing instruments have most criteria for an ideal measure maxillofacial surgery pain and Based on the knowledge of the characteristics of each scale. But the individual infant's overall condition and response must be considered in clinical decisions regarding pain and pain management at the under maxillofacial surgery bedside. Finally, different pain assessment tools may work in different circumstances for different reasons and before they are applied, the health care professional know the details of the assessed dimensions, the operationalization of use and the necessary equipment for evaluation consistent with the proposal of the tool.

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