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Newborn Pain Management: Advocating For Our Most Vulnerable Population

Christina Barlow
Providence St. Joseph Health, christina.barlow@providence.org

Shawna Blix
Providence St. Joseph Health, shawna.blix@providence.org

Sarah Saechao
Providence St. Joseph Health, sarah.saechao@providence.org

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Christina Barlow, BSN, RNC, Shawna Blix, BSN, Sarah Saechao, BSN, RNC
Providence St. Vincent Medical Center, Portland, Oregon

Background

Literature reviews show that the prevalence, assessment, and management of pain in newborns is under assessed and under treated (Linhares, 2014). The absence of pain assessment may be due to a limited understanding of neonatal pain and to the difficulties of implementing assessments and interventions for this population. As a result, procedures often are completed without assessment of pain, pain-relieving interventions, or documentation of the comfort measures provided to the newborn (Gallo, 2003).

After reviewing the literature on best practice for pain relieving interventions for newborns, it was found that non-nutritive sucking and swaddling had synergistic effects on pain relief when used with oral sucrose (Leng, 2015). Equally convincing research states that direct breast-feeding should be considered the preferred first-line analgesic intervention for painful procedures performed on full-term infants (Benoit, 2017).

An informal survey among nurses on the Providence St Vincent Medical Center Mother Baby Unit (PSVMC MBU) revealed inconsistent practice of interventions for newborn pain management. It was also discovered that nurses are not utilizing the neonatal infant pain scale (NIPS) scoring system and not consistently documenting newborn pain during painful procedures.

Purpose

To use evidence based practice to improve the assessment and intervention of newborn pain management during heel stick procedures.

Neonatal Infant Pain Scale (NIPS) table 1.1

Variable	Findings	Points
Facial expression	Relaxed (Restful face, neutral expression)	0
	Grimace (Tight facial muscles, furrowed brow, chin, jaw)	1
Cry	No cry (Quiet, not crying)	0
	Whimper (Mild moaning, intermittent)	1
	Vigorous crying (Loud scream, shrill, continuous) If infant is intubated, score silent cry based on facial movement	2
Breathing pattern	Relaxed (Usual pattern for this infant)	0
	Change in breathing (Irregular, faster than usual, gagging, breath holding)	1
Arms	Relaxed (No muscular rigidity, occasional random movements of arms)	0
	Flexed/extended (Tense, straight arms, rigid and/or rapid extension, flexion)	1
Legs	Relaxed (No muscular rigidity, occasional random leg movements	0
	Flexed/Extended (Tense, straight legs, rigid and/or rapid extension, flexion)	1
State of Arousal	Sleeping/Awake (Quiet, peaceful, sleeping or alert and settled)	0
	Fussy (Alert, restless and thrashing)	1

Methods

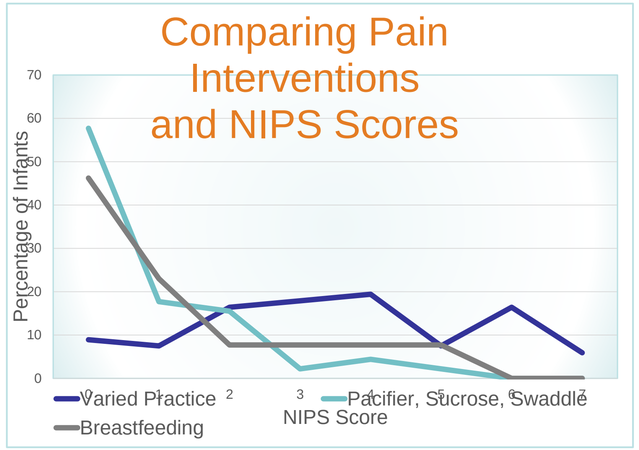
Thirteen MBU nurses were educated per policy on assessment and documentation of newborn pain using the hospital preferred NIPS. NIPS is a behavioral assessment tool for preterm and term neonates providing an objective measure when observing behavioral cues to pain. (table1.1) It is used before, during, and following known painful procedures and to assess the adequacy of interventions. NIPS scores of less than or equal to 2 are desired. Scores of greater than 2 require pain intervention and documentation of its effectiveness.

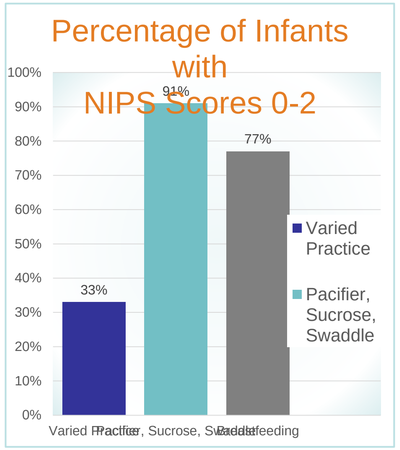
The 13 nurses were asked to continue using their preferred pain reducing intervention during newborn heel sticks and document their NIPS scores before, during, and after the procedure. The authors reviewed 67 newborn NIPS scores from the nurses involved in the study over a 3 week time period.

The 13 nurses were then provided with information and instruction on the two top pain reducing interventions as evidenced in the literature. These two interventions are swaddling combined with non-nutritive sucking on a pacifier with sucrose administration 2 minutes prior to, during, and after the heel stick and breastfeeding during the heel stick. The nurses were asked to utilize the most appropriate intervention at the time of the heel stick procedure. For example, if the newborn was currently breastfeeding or due for a feeding, the nurse would perform the heel stick with the newborn at breast. However, if the newborn was swaddled asleep in the crib, the nurse would then administer sucrose and a pacifier during the heel stick procedure. They then documented their intervention and NIPS scores in the newborn chart. The team collected and analyzed the data from the newborn charts of the 13 nurses participating in the study that had chosen one of the two interventions.

Analysis of Variance Results table 1.2

Interventions	N	Mean	Standard Deviation
Baseline	67	3.49	2.003
Pacifier, Sucrose, Swaddle	45	0.84	1.261
Breastfeeding	13	1.31	1.702





Results

During the baseline data period, only 33% of the 67 newborns received a pain score of 2 or less with nurses using varied pain interventions. In this same group 67% experienced a pain score of 3 or greater.

After the two interventions were put into place and an analysis of variance was run on the results of the study, a significant difference in the average NIPS scores for the intervention groups was found ($p<.001$). The data showed strong evidence that the pacifier/sucrose/swaddle intervention was most effective in reducing newborn pain with a baseline NIPS average score $\pm$ standard deviation of 0.83 $\pm$ 1.261. The varied practice intervention had a baseline average of 3.49 $\pm$ 2.003. The breastfeeding intervention also showed a reduction in newborn pain with a baseline average of 1.31 $\pm$ 1.702. (table 1.2)

After examining the data further, it was found that for the target goal of a NIPS score range to be 0-2, the pacifier/sucrose/swaddle intervention demonstrated to be most effective. Of the 45 newborns that received the intervention, 91% of those newborns had NIPS scores in the target goal range. The breastfeeding intervention also presented as an adequate method for the 13 newborns who received it with 77% of the patients scoring a 2 or less.

Discussion/Conclusions

The study demonstrated that the pacifier/sucrose/swaddle and breastfeeding interventions proved to be reliable pain relieving techniques for newborns during painful procedures. Varied practice interventions showed to be considerably less effective in reducing newborn pain.

With the increasing number of heel sticks newborns are receiving, the authors recommend the consistent use of one of the two interventions used in this study for newborns undergoing any painful procedure.

One limitation as evidenced by the smaller sample size of 13 newborns in the breastfeeding group, was that performing a heel stick on a breastfeeding newborn can be more challenging. It was often ergonomically difficult to perform the heel stick properly while the newborn was at breast. In addition, it was also hard to align the timing of the heel sick with a breastfeeding session.

Further research and education around the topic of pain assessment and being able to identify newborn cues of pain are essential to further understand how to reduce pain scores.

The authors recommend implementing an informal education program on the NIPS and best practice pain relieving interventions to all of the nurses in the mother baby unit similar to the education given to the 13 nurses in the study. Lastly, the authors will work with leadership within the perinatal division to educate their staff and promote the use of the two interventions in order to adequately assess and manage newborn pain.

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