Oral Sucrose Administration and Pain Control in the Neonate

Erin Kesler, BSN, RN; Heather Short, BSN, RN; & Bridgette Todd, BSN, RN
Neonatal Intensive Care Unit

Introduction
Preterm and critically born term infants undergo a large number of painful procedures in the neonatal ICU including blood draws, IV insertion, heel sticks, injections, dressing changes, and circumcision. A study by Holsti and Grunau (2010) stated an infant may undergo as many as 15 painful skin breaking events during the first weeks of life. Research has shown that even short term pain can have lasting negative effects; pain can lead to decreased oxygenation, hemodynamic instability, and increased intracranial pressure (Alsaedi, S., Elsefary, F., Louwrens, J., Mersal, A., & Sadiq, B., 2009).

Oral sucrose is a pharmacological method of pain relief for the neonate. The use of oral sucrose reduces pain in neonates as much as 16-28% on pain assessment scales (Holsti and Grunau, 2010). The underlying mechanism of the analgesic effects of sweet solutions is considered to be due to an orally mediated release of endogenous opioids (Harrison, 2007). The use of oral sucrose with and without non nutritive sucking has been shown to reduce behavioral pain scores in preterm and term neonates. Therefore, its use by nurses can be highly effective in treating acute pain in the neonate. This study poses the question of whether or not NICU staff at HMC utilize oral sucrose administration for adequate pain control in the neonate for acute pain.

Methods
• Review of the literature
• Survey of staff
• Educational poster for the unit

Literature Review
• Findings: Study 1
  150 term newborns undergoing venipuncture were evaluated with a validated behavioral acute pain rating scale (facial expression, limb movement, vocal expression).
  • Results: the analgesic effects on newborn infants of sucrose and non nutritive sucking can be detected by a behavioral pain rating scale (Holsti and Grunau, 2010).
• Findings: Study 2
  59 infants were studied receiving heel lance- they were evaluated using pain-specific brain activity recorded by EEG and behavioral observation using the PIPP-premature infant pain scoring system.
  • Although oral sucrose was not show to affect activity in the neonatal brain- oral sucrose was shown to produce significantly lower pain score in infants during heel lancings- which can be interpreted as pain relief.
  • PIPP showed improvement in pain demonstrated by naso-labial furrow eye squeeze, brow bulge, heart rate, and oxygen saturation (Boyd, S., Cornelissen, L., Fabrizi, L., Fitzgerald, M., et al. 2010).

Findings: Study 3
• 36 preterm infants were studied during painful procedures during their stay in the intensive care unit- venipuncture, heel stick
• Results: The lowest pain scores occurred in the group receiving oral sucrose and pacifier. Pain scores were determined using the PIPP pain scale.
  • Also reduced crying time (Alsaedi, S., Elsefary, F., Louwrens, J., Mersal, A., & Ali 2009)

Findings: Study 4
• An integrative review looking at 46 randomized controlled trials over a 5 year period
• Results: Emerging data suggests that if procedural pain were adequately managed in the first week of life in preterm neonates, there might be positive long term developmental effects.
  • In clinical practice, oral sucrose administration may challenge the current standard of care by becoming an integral component of a pediatric multimodal pain protocol

Results
• Pyxis Audit
  • From February 2011-February 2012: 767 Toot Sweet cups were utilized for our 36 bed unit
  • This statistic shows Toot Sweet is under utilized.

Question: How often do you administer toot sweet during acutely painful procedure?

Question: What do you use oral sucrose for?

How do nurses feel it could be easier to utilize sucrose?
• Easier Availability
  • Do not keep it located in pyxis
  • Ability to overdose in pyxis
  • Nursing order
• Standing order with new patient admissions unless contraindicated
• Increased education
• Established protocol

Factors that prevent nurses from using oral sucrose:
• NPO status/ Contraindications
• Necessity for order
• Time constraints- in a hurry to get task done
• Need to be stored in pyxis
• Habit
• Lack of understanding of what it should be used for
• Sigma of use or “over use”

Question: Do you feel you have enough education regarding the use of oral sucrose

Recommendations
• Update/review current policy at PSHMC with NICU staff
• Provide staff with more education to dispel myths and misunderstandings.
• Make nursing aware they are able to order and override oral sucrose in the Pyxis.
• Educate nursing staff on the appropriate uses of toot sweet and appropriate painful procedures.

Conclusions
• Pain can have short term and lasting effects on neonates.
• Neonates in the NICU deserve adequate pain control and experience significant pain during hospitalization.
• Oral sucrose has been shown to be effective in controlling pain with little to no adverse side effects.
• Nursing staff in the NICU need to increase their utilization of oral sucrose for pain relief in neonates experiencing acute pain.

References