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ORIGINAL ARTICLE

Comparison of glucose and sucrose in the vaccination pain

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ABSTRACT:

Background: Pain is a global issue that frequently results from medical procedures, diagnosis, treatment, and sometimes even preventative measures like immunizations. The present study compared glucose and sucrose in the vaccination pain. **Materials & Methods:** 45 neonates vaccinated against Hepatitis B of both genderswere assigned to 3 groups of 15 each. Group I received 2cc oral Glucose 25%, group II received 2cc oral Sucrose 25% with Syringe were given for 30 sec then 2 min later Hepatitis-B vaccine injected by vaccinator and in group III (control), no intervention was performed. Pain intensity was measured by Neonatal Infant Pain Scale (NIPS) during 1-2 min. **Results:** There were 8 male and 7 female in group I, 6 male and 9 female in group II and 7 male and 8 female in group III. The mean pain score in group I was 3.20, in group II was 2.70 and in group III was 5.30. The difference was significant (P< 0.05). **Conclusion:** Compared to the other group, patients who received glucose or sucrose experienced less severe discomfort. Patients who took sucrose experienced less discomfort than those in the glucose group.

Keywords: glucose, sucrose, vaccination pain

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INTRODUCTION

Pain is a global issue that frequently results from medical procedures, diagnosis, treatment, and sometimes even preventative measures like immunizations. By midgestation, both preterm and full-term infants may react to discomfort and unpleasant stimuli, according to a thorough evaluation of the literature. Health care professionals must find safe and effective ways to address the impacts of procedural pain in light of these findings.[1] First and foremost, it is morally imperative to relieve the newborn's discomfort, as it may result in reduced oxygenation, hemodynamic instability, or elevated intracranial pressure. According to recent studies, even temporary discomfort might have detrimental long-term repercussions in medical settings. Infants who have painful treatments like vaccinations are not regularly given analgesia.[2]

For the children getting the vaccination, their parents, and the healthcare professionals who have to provide them, the discomfort of the shot is a cause of worry and concern.These days, a variety of techniques are employed to lessen the newborn's procedure discomfort, including milk, pacifier sucking, and oral sugar solutions, one of the most researched.[3] It has also been discovered that sucrose, glucose, and nonsucrose sweet-tasting solutions had analgesic benefits on pain reactions in both term and preterm newborn newborns during blood collection, by heel stick, or venipuncture.[4]

Two mechanisms are thought to be involved in the pain-relieving effects of oral sugar solutions, such as glucose and sucrose: the intraoral fluid's orotactile stimulation produces an initial effect, and the release of endogenous opioids during orogustatory stimulation prolongs the effect. Oral sucrose or glucose has been used in several trials to reduce pain effects during venipuncture or heel sticks used for blood collection.[5]The present study compared glucose and sucrose in the vaccination pain.

MATERIALS & METHODS

The study was carried out on 45 neonates vaccinated against Hepatitis B of both genders. All parents gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were assigned to 3 groups of 15 each. Group I received 2cc oral Glucose 25%, group II received 2cc oral Sucrose 25% with Syringe were given for 30 sec then 2 min later Hepatitis-B vaccine injected by vaccinator and in group III (control), no intervention was performed. Pain intensity was measured by Neonatal Infant Pain Scale (NIPS) during 1-2 min. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Groups	Group I	Group II	Group III
Agent	Glucose 25%	Sucrose 25%	Control
M:F	8:7	6:9	7:8

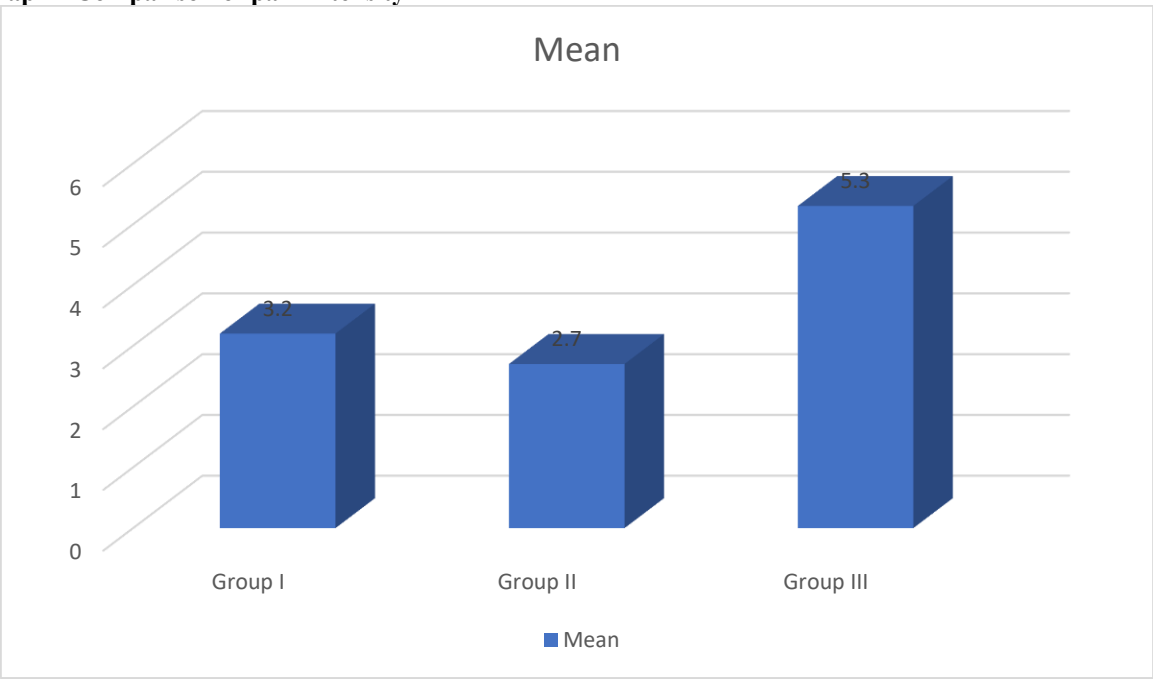
Table I shows that there were 8 male and 7 female in group I, 6 male and 9 female in group II and 7 male and 8 female in group III.

Table II Comparison of pain intensity

Groups	Mean	P value
Group I	3.20	0.01
Group II	2.70	
Group III	5.30	

Table II, graph I shows that the mean pain score in group I was 3.20, in group II was 2.70 and in group III was 5.30. The difference was significant (P< 0.05).

Graph I Comparison of pain intensity



DISCUSSION

Administration of sucrose, a disaccharide made up of fructose and glucose, has been the most researched non-pharmacological treatment for newborn pain relief. It is believed that endogenous opioid pathways triggered by sweet taste are responsible for the relaxing and pain-relieving effects of sucrose.[6] Because sucrose has a strong taste, it also provides an immediate short-term attention-gaining effect that calms people down and stops them from sobbing. The sweetener glucose is 0.75 times sweeter than sucrose. There are numerous psychometric instruments available to evaluate a newborn's suffering. The evaluation of the healthy newborn does not now incorporate the majority of these instruments.[7] There is insufficient data on how these tools are used and how they affect clinical practice. Given that pain is multifaceted, it has been discovered that multidimensional measurements are superior to others. The Neonatal Infant Pain Scale (NIPS), a multidimensional measure, meets this requirement.[8] The present study compared glucose and sucrose in the vaccination pain.

We found that there were 8 male and 7 female in group I, 6 male and 9 female in group II and 7 male and 8 female in group III.Suhrabi Z et al[9]compared the effectiveness of two analgesics for the management of vaccination pain. A total of 90 neonates to be vaccinated against Hepatitis B were assigned to Glucose, Sucrose and control groups. Research results showed that there were no significant differences between groups in term of Apgar score, delivery type, sex, head circumstance, weight and height. By comparison of pain severity in two groups, mean and Standard deviation of pain, group that received Glucose solution had more intensity than Sucrose group (3 ± 1.66 vs. 2.90 ± 1.44), but this difference was not significant statistically (p=0.78). Comparison of pain intensity in control and intervention groups showed that the pain intensity in control group is higher than intervention groups (p<0.001).

We observed that the mean pain score in group I was 3.20, in group II was 2.70 and in group III was 5.30. Thyr M et al[10]evaluated oral glucose as an analgesic to reduce infant distress after immunization during the first year of life and to investigate if these effects change during this period.A total of 110 infants were randomized to receive 2 mL of 30% glucose or water. The same solution was given at 3, 5 and 12 months. Crying was registered from onset of the injection up to 120 seconds. Infanrix Polio Hib was administered intra-muscular in the thigh. Observation nurse and parents were blind to the nature of the solution.Administration of glucose reduced the mean crying time by 22% at 3 months, 62% at 5 months and

52% at 12 months. The difference was significant at 5 and at 12 months. In the water group, there was a significant correlation between the children who cried at 3 months and who subsequently cried at 5 and 12 months. No correlations were found in the glucose group.Sweet solution can be used as a simple and safe method to reduce the distress following immunization in infants up to 12 months.

Wilson S et al[11]evaluated the effectiveness of oral sucrose in decreasing pain during minor procedures in infants of 1-6 months corrected age. A blinded randomized controlled trial with infants aged 4-26 weeks who underwent venipuncture, heel lance or intravenous cannulation were stratified by corrected age into > 4-12 weeks and > 12-26 weeks. They received 2 mL of either 25% sucrose or sterile water orally 2 minutes before the painful procedure. Non-nutritional sucking and parental comfort, provided in adherence to hospital guidelines, were recorded. Pain behavior was recorded using a validated 10 points scale at baseline, during and following the procedure. Data collectors were blinded to the intervention. A total of 21 and 20 infants received sucrose and water, respectively, in the > 4-12-week age group, and 21 and 22, respectively, in the > 12-26-week age group. No statistical differences were found in pain scores between treatment and control groups at any data collection points in either age group. Infants aged > 4-12 weeks who did non-nutritional sucking showed statistically significantly lower median pain scores at 1, 2, and 3 minutes after the procedure than those who did not suck. Infants aged > 4-26 weeks exhibited pain behavior scores that indicated moderate to large pain during painful procedures; however, there was insufficient evidence to show that 2 mL 25% sucrose had a statistically significant effect in decreasing pain. Infants should be offered non-nutritional sucking in compliance with the Baby Friendly Health Initiative during painful procedures.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that compared to the other group, patients who received glucose or sucrose experienced less severe discomfort. Patients who took sucrose experienced less discomfort than those in the glucose group.

REFERENCES

1. Schechter NL, Zempsky WT, Cohen LL, McGrath PJ, McMurtry CM, Bright NS. Pain reduction during pediatric immunizations: evidence-based review and recommendations. Pediatrics. 2007;119(5):1184-98.
2. Gradin M, Schollin J. The role of endogenous opioids in mediating pain reduction by orally administered glucose among newborns. Pediatrics. 2005;115(4):1004-07.
3. Olson TL, Downey VW. Infant physiological responses to noxious stimuli of circumcision with anesthesia and analgesia. Pediatric nursing. 1998;24(4):385.
4. Gallo AM. The fifth vital sign: implementation of the Neonatal Infant Pain Scale. Journal of Obstetric, Gynecologic, & Neonatal Nursing. 2003;32(2):199-206.
5. Harrison D, Stevens B, Bueno M, Yamada J, Adams-Webber T, Beyene J, et al. Efficacy of sweet solutions for analgesia in infants between 1 and 12 months of age: A systematic review. Archives of disease in childhood. 2010;95(6):406-13.
6. Gradin M, Finnström O, Schollin J. Feeding and oral glucose—additive effects on pain reduction in newborns. Early human development. 2004;77(1):57-65.
7. Taghinejad H, Delpisheh A, Suhrabi Z. Comparison between massage and music therapies to relieve the severity of labor pain. Women's Health. 2010;6(3):377-81.
8. Gibbins S, Stevens B. Mechanisms of sucrose and non-nutritive sucking in procedural pain management in infants. Pain research & management. 2001;6(1):21-2.
9. Suhrabi Z, Taghinejad H, Valian K, Sayehmiri K, Taheri S. A comparative study on the efficacy of glucose and sucrose on the vaccination pain: a randomized controlled clinical trial. Journal of clinical and diagnostic research: JCDR. 2014;8(10):01.
10. Thyr M, Sundholm A, Teeland L, Rahm VA. Oral glucose as an analgesic to reduce infant distress following immunization at the age of 3, 5 and 12 months. Acta Paediatrica. 2007;96(2):233-36.
11. Wilson S, Bremner AP, Mathews J, Pearson D. The Use of Oral Sucrose for Procedural Pain Relief in Infants Up to Six Months of Age: A Randomized Controlled Trial. Pain Management Nursing. 2013;14(4):95-105