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ORAL DEXTROSE V/S BREAST MILK FOR THE PAIN RELIEF OF NEWBORN INFANTS

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Abstract:
Objective- *In newborn infant's pain management is underused particularly for mild to moderate pain. For this purpose, glucose and sucrose use can be very effective. The main objective of this is to analyze the oral dextrose effects on pain relief in newborn infants.*
Methodology- *For this study 124 newborn infants were enrolled for clinical trial which was randomized controlled. The Study was conducted in Bahawalpur Victoria Hospital in Paediatric unit .Before venipunctures, the enrolled infants were randomized to get breast milk or oral dextrose (25%) two minutes. After venipunctures, to know the pain reactions oxygen saturation, heart rate, and NIPS pain scoring system was recorded.*
Results- *After venipunctures in dextrose group, pain was significantly lower (at 1st minute NIPS pain score was 6.62+0.82 and 4.67+1.04, at 2nd minutes it was 4.08 ± 1.05 and 2.04 ± 1.45 and at 3rd minutes it was 3.02+1.08 and 1.63+0.76 respectively). After comparison it was observed that 1st group heart rate was higher than the 2nd group as in 2nd group it was (144.8 ± 12.44/min) and in 1st group it was (166.57 ± 12.25/min). In both groups, desaturation was observed.*
Conclusion- *In newborn to manage pain from mild to moderate the solution of 2ml of 25% dextrose is non-pharmacologic, non-expensive, easy, and useful method.*
Keywords: *analgesia, breast milk, dextrose, newborn, pain.*

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INTRODUCTION:

Before getting discharged from hospital after birth, neonates undergoes various kind of painful procedures. In order to manage pain in neonates major procedural and surgical methods used in nursing care and minor procedures which is also effective. In early stages of life, for pain recognition chemical and neuro-anatomical development is used. These kinds of painful procedures can also affect the biopsycho-social development of that neonates later. However, some of the behavioral and physiological parameters can also be used as the pain evaluator in early stages of life. Physiological parameters are hormonal changes, saturation of oxygen, blood pressure, respiratory rate and heart rate, whereas, crying, motor patterns and facial mimicry are the behavioral parameters. Also, various kinds of non-pharmacological and pharmacological technique are used for pain management.

According to various studies, mild to moderate pain of neonates can be managed by topical anesthetic gel or cream, sensorial saturation, massage, kangaroo care, breast milk, glucose, sucrose and pacifier. However, in all hospitals, topical anesthetic creams or gels and sucrose are not available as these are expensive, but 25% dextrose can be available everywhere and also very cheap. Remaining methods like sensorial stimulation, massage and kangaroo care, are difficult in most of the cases. For the treatment of severe pain or from mild to moderate pain, solution of oral glucose is used normally. However, there are also some side effects of using oral glucose. In newborn infant's pain management is underused particularly for mild to moderate pain. The main objective of this was to analyze the oral dextrose effects on pain relief in newborn infants.

METHODOLOGY:

For this study 124 newborn infants were enrolled for clinical trial which was randomized controlled. For this study, a consent was got from institutional ethical committee. Before venipunctures, the enrolled infants were randomized to get breast milk or oral dextrose (25%) two minutes. For this study, those infants were selected who had gestational age of 37 weeks and had age of less than seven days, had no congenital anomalies, syndrome or previous surgery, were fed before 1 hour of data collection, had Apgar scores of 7 or more, and whose mothers were not addicted on any drugs, or had any disease. This study aimed to analyze the 25% oral dextrose effects on pain relief in newborn infants. For this, those neonates were excluded who were not meeting the inclusion criteria and who were diagnosed with any neurologic problem or if they had got sedative or analgesic drugs within 24 hours of data collection, and also if their mother had any problem due to which she couldn't feed her baby.

All the enrolled neonates were divided into two groups in which 1st group received 25% dextrose as painkiller and 2nd group received breast milk to control pain. With a needleless syringe 2ml of 25% dextrose (1st group) and 2ml of breast milk (2nd group) was given two minutes before venipuncture to the tongue anterior portion. Syringe were prepared by the research assistants containing both solutions and all the syringes were labeled and covered according to the group. During data collection neonates were kept in servo mode. To monitor oxygen saturation and heart rate, oxygen saturation monitor was applied to the foot and hand of the neonates. After two minutes, assigned solution again given to the neonates. According to the ability to swallow the duration of administration was kept between 10 to 30 secs and during this, neonates were kept in semi-seated position. Again after 2 minutes, all the neonates undergo venipunctures. After venipunctures, to know the pain reactions oxygen saturation, heart rate, and NIPS (Neonatal Infant Pain Scale) was recorded.

RESULTS:

During the study 485 neonates were enrolled in which 297 were excluded as they did not meet the criteria of study and the whole observation was performed on remaining 188 infants. Each group had 94 infants and after this 18 more were excluded as they could not take the whole given solution. Moreover, 22 were not agree to for the study, and 24 again excluded. So, finally the observations were performed on the remaining 124 babies with 82 in each group. The mean gestational age of both groups was 39 + 1.13 weeks and 38.5 + 250.2 weeks respectively. The mean weight at birth of both groups was 2969.54 ± 250.2 grams and 2880 ± 290.8 grams respectively.

Table 1. Neonatal/Infant Pain Scale (NIPS)-Recommended for children less than 1 year old. (A score greater than 3 indicates pain).

Pain assessment		**Score**
Facial expression		
0-relaxed muscles	Restful face, neutral expression	
1-grimace	Tight facial muscles; furrowed brow, chin, jaw (negative facial expression-nose, mouth brow)	
Cry		
0-no cry	Quiet, not crying	
1-whimper	Mild moaning, intermittent	
2-vigorous cry	Loud scream; rising, shrill, continuous	
Breathing pattern		
0-relaxed	Usual pattern for this infant	
1-change in breathing	Indrawing, irregular, faster than usual; gagging, breath holding	
Arms		
0-relaxed/restrained	No muscular rigidity, occasional random movements of arms	
1-flexed/extended	Tense, straight arms,rigid and/or rapid extension, flexion	
Legs		
0-relaxed/restrained	No muscular rigidity, occasional random movement of legs	
1-flexed/extended	Tense, straight legs, rigid and/or rapid extension, flexion	
State of arousal		
0-sleeping/awake	Quiet, peaceful, sleeping or alert, random leg movements	
1-fussy	Alert, restless and thrashing	

Table 2. Showing no statistical differences between the 2 groups.

Characteristics	**Dextrose (62) Group I**	**Breast milk (62) Group II**	**p-value**
Gestational age (wks)	39.4 ± 1.14	38.6 ± 1.24	0.42
Birth weight (gram)	2978.54 ± 250.16	2876 ± 287.8	0.48
Postnatal age (day)	4.73 ± 1.25	4.53 ± 1.43	0.52
Gender (Male/Female)	32/30	28/34	0.29

Table 3. There were no side effects noted in any of the neonates in the study group and all children were observed for the next 30 days for it.

	(Dextrose) Group I	**(Breast milk) Group II**	**p-value**
Pain Score (at 1 min)	4.67 ± 1.04	6.62 ± 0.82	0.04
Pain Score (at 2 min)	2.04 ± 1.45	4.08 ± 1.05	0.02
Pain score (at 3 min)	1.63 ± 0.76	3.02 ± 1.08	0.01
Heart rate/min (at 3 min)	166.57 ± 12.25	144.8 ± 12.44	0.13

After venipunctures in dextrose group, pain was significantly lower (at 1st minute NIPS pain score was 6.62+0.82 and 4.67+1.04, at 2nd minutes it was 4.08 ± 1.05 and 2.04 ± 1.45 and at 3rd minutes it was 3.02+1.08 and 1.63+0.76 respectively). After comparison it was observed that 1st group heart rate was higher than the 2nd group as in 2nd group it was (144.8 ± 12.44/min) and in 1st group it was (166.57 ±

12.25/min). In both groups, desaturation was observed.

DISCUSSION:

In this study it was found that 25% dextrose can be used for managing the mild to moderate pain in neonates' venipunctures effectively. According to various studies, mild to moderate pain of neonates can be managed by topical anesthetic gel or cream, sensorial saturation, massage, kangaroo care, breast milk, glucose, sucrose and pacifier. However, in all hospitals, topical anesthetic creams or gels and sucrose are not available as these are expensive, but 25% dextrose can be available everywhere and also very cheap. Remaining methods like sensorial stimulation, massage and kangaroo care, are difficult in most of the cases. For the treatment of severe pain or from mild to moderate pain, solution of oral glucose is used normally. However, there are also some side effects of using oral glucose. In newborn infant's pain management is underused particularly for mild to moderate pain. The main objective of this was to analyze the oral dextrose effects on pain relief in newborn infants.

All the infants were closely monitored for side effects of dextrose for 3 days and didn't find any. There was no nausea, vomiting, feeding intolerance, in any neonates. The limitation of this study was that preterm infants were not included as they undergo more painful procedures than the term infants. The small sample size was also a limitation. In this study, we were unable to explain the cause of tachycardia in the study group as compared to the control group.

CONCLUSION:

In newborn to manage pain from mild to moderate the solution of 2ml of 25% dextrose is non-pharmacologic, non-expensive, easy, and useful method.

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