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RESEARCH ARTICLE

A CROSS SECTIONAL STUDY ON ANALGESIC EFFECT OF ORAL 25% DEXTROSE DURING ROUTINE IMMUNISATION AT A TERTIARY CARE CENTRE

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Key words:-
FLACC (Face, Leg, Activity, Cry, Consolability)

Abstract

Background: Pain in neonates can evoke negative behavioural, physiologic, or metabolic responses. Repeated painful exposures can have deleterious long-term effects on neonates.1 Pain management in neonates in both preterm and full term is a fundamental part of neonatal care. Neonatal pain perception is more intense than in adults due to dense sensory nerve endings in neonatal skin and mucous membranes.2 Pain and stress may alter neurodevelopment and later perceptions of painful stimuli and behavioural responses.3.

Materials and Methods: This observational study included 90 Infants presenting to paediatric OPD for routine immunisation. Two ml of 25% dextrose was given 2 minutes prior to immunisation for 45 infants and no intervention was performed for control group. Pain was assessed using FLACC pain scale. Data on demographics and age at immunisation were collected and analyzed using SPSS version 25.

Results: A total of 90 infants to be vaccinated were assigned to 25% Dextrose and control group. Two ml of 25% dextrose was given 2 minutes prior to immunisation for 45 infants and no intervention was performed for control group. The pain intensity was assessed using FLACC behavioural pain scale (Face, Legs, Activity, Cry, Consolabilty behavioural pain scale). Out of babies which received 25% dextrose 84% of them were term babies and out of control group 81% of them were term babies. In 25% dextrose group 23% of them had moderate pain (FLACC score of 4-6) while in control group 48% of them had moderate pain. And also in 25% dextrose group 24% of them had FLACC score of ≥6 while in control group 48% of them had FLACC pain score of ≥6.

Conclusion: A total of 90 infants were included in this study and out of which 45 infants received oral 25% dextrose prior to vaccination. The dextrose group which received oral 25% dextrose showed to have less indicators of pain such as activity, cry, consolability.

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Introduction:-

1. Pain management in infants during routine immunisation is a vital component of pediatric care. Unrelieved pain in early life has been associated with adverse short- and long-term consequences, including altered pain sensitivity and behavioral changes later in life.[4] Immunisations, although essential for disease prevention, are among the most common painful procedures in infancy. However, pain management during such procedures remains inconsistent in clinical practice.[5]
2. Various non-pharmacological methods have been explored to alleviate procedural pain in neonates and infants, among which oral sweet solutions such as sucrose and dextrose have shown promising results. The analgesic effect is believed to be mediated by activation of the endogenous opioid pathways triggered by the sweet taste.[6] Dextrose, especially in concentrations like 25%, is inexpensive, easy to administer, and has been reported to be effective in reducing pain scores during minor procedures.[7]
3. Previous studies have demonstrated that oral dextrose significantly reduces crying time, facial grimacing, and other behavioral indicators of pain in infants undergoing immunisation.[8] Despite growing evidence, the implementation of such interventions in tertiary care settings, where resource constraints and high patient loads are common, remains limited.
4. This study aims to evaluate the analgesic efficacy of oral 25% dextrose when administered prior to routine immunisation in infants at a tertiary care centre, thereby contributing to improved procedural pain management practices.

Objectives:-

To study the analgesic effect of oral 25% dextrose during routine immunisation in infants.

Materials and Methods:-

Study Design and Setting:

This observational study was conducted at the Akash Institute of Medical Sciences and Research Centre, Devanahalli, Bengaluru Rural, over a one-month period from August 2024.

Study Population:

The study included infants presenting to Paediatric OPD for routine immunisation.

Inclusion and Exclusion Criteria

- Inclusion Criteria: Infants presenting to Paediatric OPD for routine immunisation.
- Exclusion Criteria:
  - Febrile babies
  - Hemodynamically unstable babies.

FLACC Pain scale:

The FLACC pain scale is a behavioral pain assessment tool used for infants and young children (typically aged 2 months to 7 years) who are unable to verbalize their pain. It is especially useful in clinical settings, including during procedures like immunisation.

Each of the five categories is scored from 0 to 2, for a total possible score ranging from 0 (no pain) to 10 (severe pain).

FLACC Score			
CATEGORY	0 POINTS	1 POINT	2 POINTS
Face	Disinterested	Occasional grimace, withdrawn	Frequent frown, clenched jaw
Legs	No position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Normal position	Squirming, tense	Arched, rigid, or jerking
Cry	No crying	Moans or whimpers	Constant crying, screams or sobs
Consolability	Content, relaxed	Distractible	Inconsolable
SCORES ADD UP IN RANGE FROM 0–10			

Interpretation:
0 = Relaxed and comfortable
1–3 = Mild discomfort
4–6 = Moderate pain
7–10 = Severe discomfort/pain

This scale is ideal for studies assessing pain in infants.

Data Collection:
Data were systematically collected using a structured proforma that captured the following information:
- Age at the time immunisation.
- Sex (male/female).
- Immunisation weeks.

Data Analysis
Collected data were entered into a computer and analysed using Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. Frequencies and percentages were calculated for categorical variables. The analysis aimed to study the effect of oral 25% dextrose to relieve the pain in neonates.

Ethical Considerations
The study was conducted in accordance with ethical guidelines, and approval was obtained from the institutional ethics committee. Informed consent was obtained from the parents or guardians of all participating neonates. Confidentiality of patient information was maintained throughout the study.

Results:-

Image 1:-
Image 1 shows the percentage of term babies in both the 25% Dextrose group and the control group.

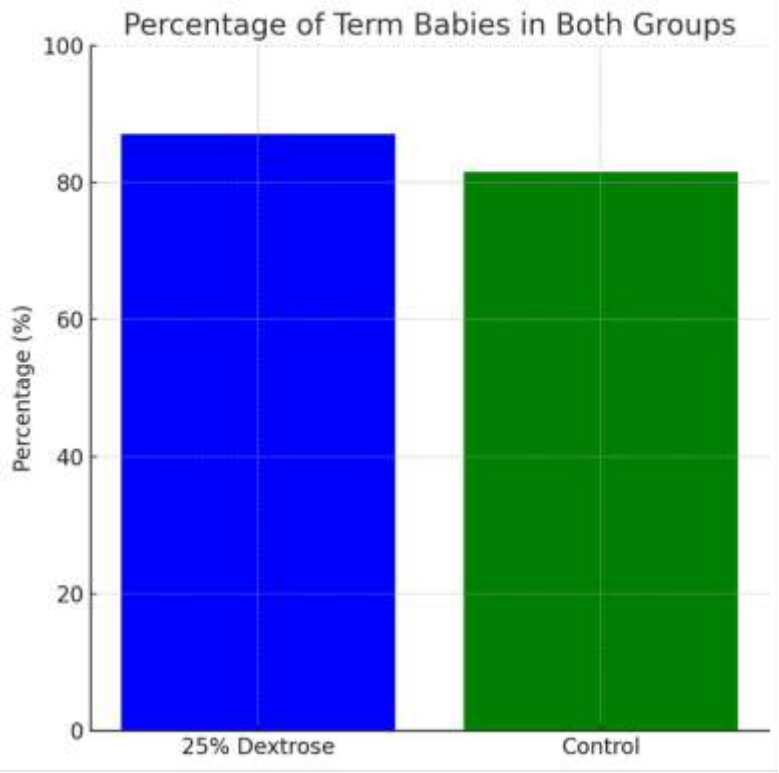


Image 2:-

Image 2:- Comparision of FLACC Score of 4-6 in 25% dextrose vs Control group.

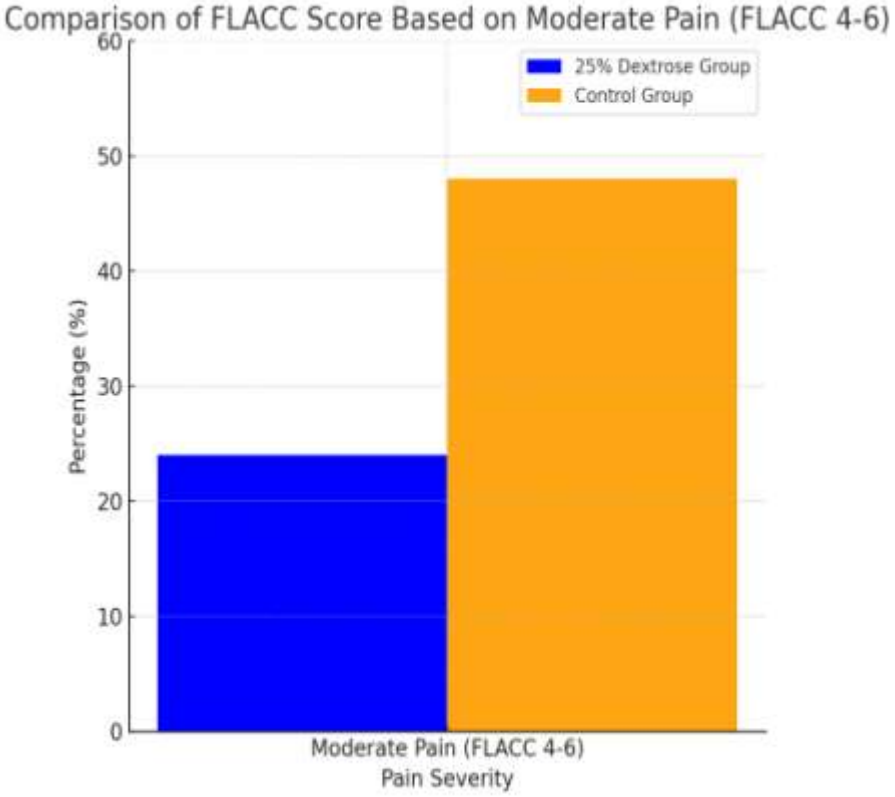


Image 3:-

Image 3:- Illustrates the proportion of infants with FLACC pain scores ≥6 and <6 in both the 25% Dextrose group and the control group.

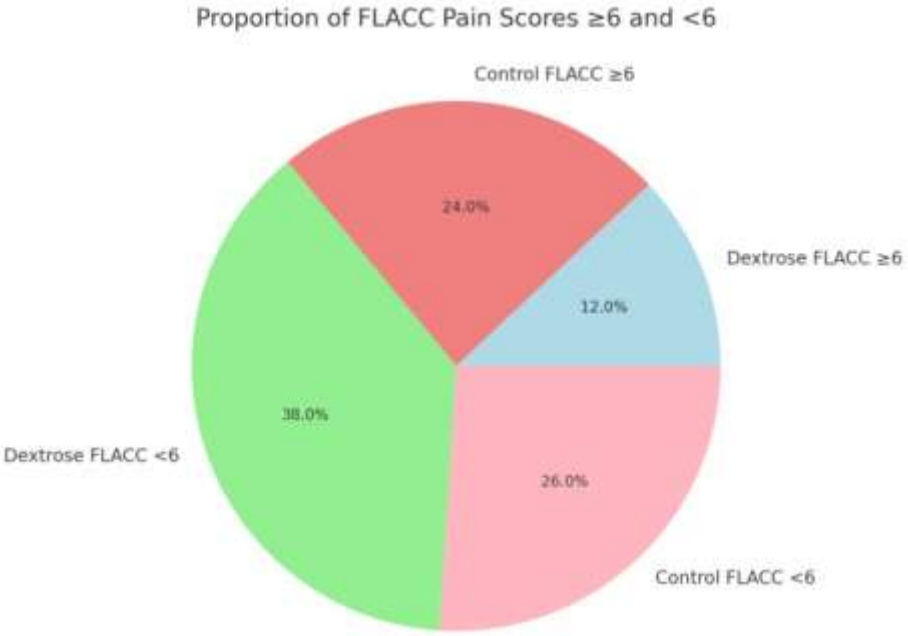
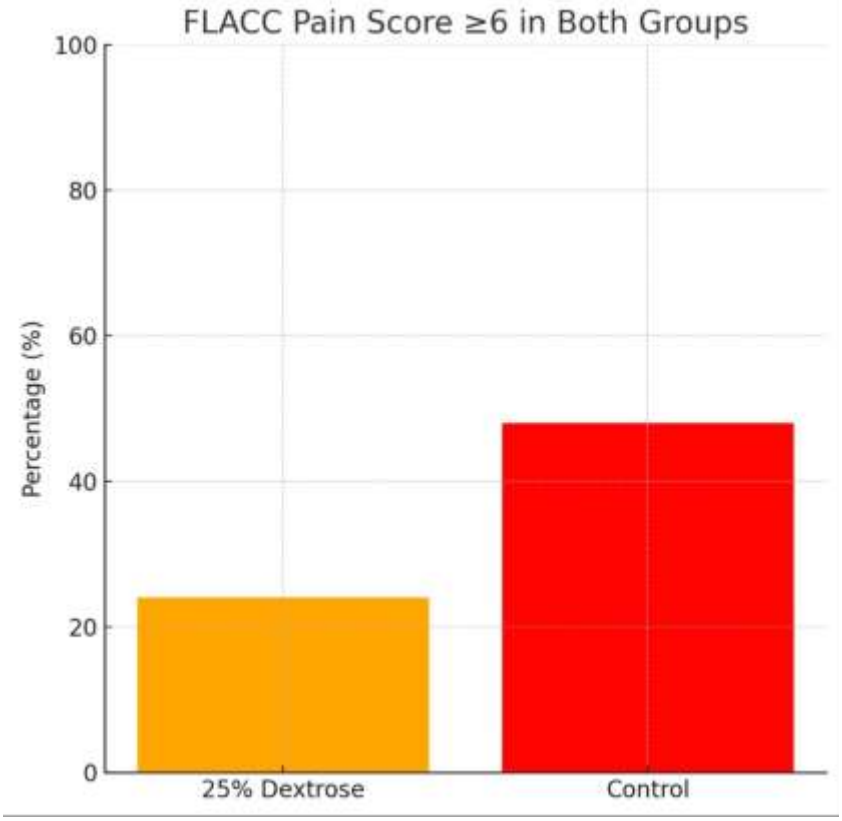


Image 4:-

Image 4:- Compares the percentage of infants with a FLACC pain score of ≥6 in both groups.



Discussion:-

The study highlights the analgesic effects of oral 25% dextrose in reducing pain during routine immunization in infants. The results clearly indicate a significant reduction in pain responses, as assessed by the FLACC scale, in the group that received 25% dextrose compared to the control group. Only 24% of infants in the dextrose group had a FLACC score of ≥6, compared to 48% in the control group, demonstrating a notable difference in pain perception between the groups.

These findings are consistent with previous research indicating that oral dextrose can act as an effective analgesic in neonates during painful procedures such as venepuncture and immunizations. Mundol et al.[1] (2018) similarly found that 25% oral dextrose provided substantial pain relief during neonatal BCG immunization.

The mechanism through which dextrose exerts its analgesic effect is believed to be linked to the activation of endogenous opioid pathways and distraction through taste sensation. Furthermore, non-pharmacological methods such as oral dextrose are important in neonatal care as they are simple, cost-effective, and safe interventions to manage procedural pain. Deka et al.[3] (2022) demonstrated that such non-pharmacological methods, including oral sucrose and dextrose, are reliable alternatives to pharmacological interventions for pain management in neonates

Conclusion:-

A total of 90 infants were included in this study and out of which 45 infants received oral 25% dextrose prior to vaccination. The dextrose group which received oral 25% dextrose showed to have less indicators of pain such as activity, cry, consolability.

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