To Assess The Effectiveness of Oral Dextrose on Altering the Pain Level During Venipuncture Among Neonate

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ABSTRACT

Neonates, who are sick, require a number of painful therapeutic and diagnostic procedures and cry vigorously during these procedures. The medical and paramedical staffs usually ignore pain felt during these procedures. Objectives: 1. To assess the pain level of neonates undergoing venipuncture in the control group 2. To assess the pain level of neonates undergoing venipuncture in experimental group. 3. To assess the effectiveness of oral dextrose on altering the pain level during venipuncture among the neonates. 4. To associate the pain level of control group and experimental group with selected demographic variables. The research approach used for the study was interventional Evaluatory approach. The study was conducted in Neonatal Intensive Care Unit at Wardha city Maharashtra, India, using post test only control design. A Non-Probability purposive sampling technique was used to selecting 50 neonates undergoing venipuncture admitted in NICU. The data collected, tabulated, and analyzed in terms of objectives of study using descriptive and inferential statistics. In control group, 48% of the neonates had moderate level of pain score and 52% had severe level of pain score. Minimum pain score in was 7 and maximum pain score was 10. Mean pain score was 8.48 ± 0.91 and mean percentage of pain score was 70.66 ± 7.65 . While in experimental group 80% of the neonates had mild level of pain score and 20% had moderate level of pain score. Minimum pain score in was 1 and maximum pain score was 6. Mean pain score was 3.28 ± 1.51 and mean percentage of pain score was 27.33 ± 12.61 . The comparison of pain score of neonates in control and experimental group. Mean, standard deviation and mean difference values are compared and student's unpaired 't' test is applied at 5% level of significance. The tabulated value for $n=50-2$ i.e. 48 degrees of freedom was 2.00. The calculated 't' value i.e. 14.68 are much higher than the tabulated value at 5% level of significance for overall pain score of neonates which is statistically acceptable level of significance and $p=0.0001$ which is less than 0.05. Hence it is statistically interpreted that the oral dextrose on altering the pain level during venipuncture among the neonates was effective. The association was found in between pain score and age in days of neonates. The tabulated 'F' values was 3.44(df=2,22) which is much less than the calculated 'F' i.e. 9.09 at 5% level of significance. Also the calculated 'p'=0.001 which was much less than the acceptable level of significance i.e. 'p'=0.05. which concluded that age in days of neonates is statistically associated with their pain score According to the results of this study, Administration of oral dextrose is more effective for minimizing the pain during venipuncture in experimental group as compared to control group. Hence oral administration was cost effective, available and highly feasible. Hence the researcher concluded that administration of oral dextrose on altering the pain level during venipuncture among neonate.

KEY WORDS: EFFECTIVENESS, ASSESS, ORAL DEXTROSE, ADMINISTRATION, NEONATE, VENIPUNCTURE.

INTRODUCTION

Development in the medical field and the progression in the specialized nursing care are interrelated for good prognosis and supports in minimizing the mortality

in morbidity rate in less gestational age as well as the neonates who categorized under appropriate for gestational age. The sick Newborn Intensive Care Unit is an highly designed structure where the credentialed health care personnel administered the specialized care and meant for low birth weight, less for appropriate gestational age, babies of high risk mothers who are diagnosed in their prenatal period or the other health issues followed after the delivery.

Neonates can face upto 400 painful procedures while they are being cared for in the neonatal intensive care units. Many of them face painful procedures, like heel pricks, cannulation, endotracheal intubations etc daily. Pediatric

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patients cited pain related to procedures especially with the placement of intravenous cannula as the most common one. One of the widely performed procedures is peripheral intravenous cannulation that is required for the administration of antibiotics, fluids, blood products and other therapies. It is often a necessary procedure and causes a lot of distress to the patients. Nurses play a valuable role in minimizing the physical discomfort and the related complications. Peripheral intravenous cannulation is associated with a number of both physical and physiological complications.

Infants are unable to verbalize pain and that is why it might go unnoticed. In the past, It was believed that neonates did not feel pain or that a painful experience would be forgotten as rapidly it has occurred. However recent evidences have come up which suggests that not only do they feel pain but they feel it more intensely than adults do. Venipuncture for babies' in the neonatal intensive care unit (NICU) or special care nursery is a common event that causes pain to the new born. Recent studies have proven that, the babies early pain experience may alter their pain response in later life. Many attempt have been made to reduce the pain sensation in the neonates undergoing blood collection. One of the most studied methods is the administration of sucrose or dextrose, before the heel prick, which has been shown to effectively reduce pain sensation in the neonates

METHODS

The Interventional Evaluative Approach (Randomized control trial) Was undertaken on the basis of prevalence. 50 neonates were selected and enrolled via non purposively who are admitted in Neonatal Intensive Care Unit undergoing venipuncture and simple random technique was used in the study. Data was collected by structure questionnaire and standardized neonatal pain assessment tool during the month of December 2020. Neonates who are admitted in NICU, Neonates whose mothers are willing to participate in the study, Neonates whose birth weight is 2.5 kg or more, Neonates who have completed 37 weeks of gestation at the time of birth and Neonates who are active and alert were included in the study. While, Neonates who have nil per oral status, Neonates with congenital anomalies, Mother having history of gestational diabetes, Neonates who are on ventilator, Neonates who are seriously ill, Neonates having history of repeated and frequent admission were excluded. The questionnaire was made in most generally spoken Marathi and English language in the area. Participation was on voluntary basis at the report. Participants answered the questionnaire themselves anonymously.

The tool was devised through several steps of item generation, reduction, weightage, pilot testing of the tool and validating the tool, the content validity was determined after the opinion of 10 experts in the field of child health nursing. The tool validation included measurement of inter-observer reliability and generation of criteria related, construct and content related validity.

The tool was later revised by English language expert and then translated into Marathi language by the English translator experts without altering the tool meaning. The institutional ethical committee of Datta Meghe Institute Of Medical Sciences, Deemed to be university sanctioned approval for conducting the research study was obtained. The findings were summarized by concentrations and percentages, categorically. The programme used in the study was SPSS 24.0 and the edition of graph pad prism 7.0 and $P < 0.05$ is regarded as degree of significance.

The questionnaire consist of parts for acquiring demographic information and relevant questions related to the pain assessment among neonates during venipuncture admitted in Neonatal intensive Care Unit. To accomplish the objective of the study the investigator collected data from 50 neonates who were undergoing venipuncture and admitted in NICU who comes under the inclusion criteria by a standardized and valid pain assessment tool COVERS neonatal pain scale.

Table 1. Percentage wise distribution of neonates according to their demographic characteristics.

Demographic Variables	Control Group	Experimental Group
Age(days) of neonates		
0-7 days	18(72%)	14(56%)
8-14 days	5(20%)	6(24%)
15-21 days	2(8%)	5(20%)
22-28 days	0(0%)	0(0%)
Diagnosis		
Abdominal Colic	0(0%)	2(8%)
Conjunctivitis	1(4%)	2(8%)
Feeding intolerance	5(20%)	4(16%)
Napkin Rash	2(8%)	2(8%)
Neonatal Syndrome	0(0%)	2(8%)
Neonatal Hyperbilirubinemia	6(24%)	6(24%)
Respiratory Distress syndrome	11(44%)	7(28%)
Gender		
Male	12(48%)	11(44%)
Female	13(52%)	14(56%)
Time gap between last feed and procedure		
With half an hour	5(20%)	5(20%)
30 min-1 hr	7(28%)	3(12%)
1-2 hrs	5(20%)	13(52%)
>2 hrs	8(32%)	4(16%)
Mode of Delivery		
Normal Vaginal Delivery	20(80%)	21(84%)
Caesarean Section	5(20%)	4(16%)
Instrumental Delivery	0(0%)	0(0%)

Statistical Analysis: Analysis of data was done by using descriptive and inferential statistics both. Descriptive statistics was used to describe the basic feature of the data in a study and inferential statistics was used to make inferences from your data to make more general

conditions. The percentage wise distribution of neonates undergoing venipuncture admitted in Neonatal Intensive Care unit about their demographic characteristics was calculated. The statistical tests were used for the analysis were Students unpaired t-test, one-way ANOVA, Pearson' correlation coefficient, and reliability analysis. The suitable sample drawn from the study population of 50 subjects who stayed in Wardha district. The data was collected to classify the sample characteristics including the age of the newborn in days, diagnosis, gender, mode of delivery and time gap between last feed and procedure.

RESULTS

Distribution of neonates according to age (in days) shows that in the experimental group 14(56%) of neonates were under the age of 0 – 7 days, 6 (24%) of neonates were under the age of in between 8-14 days and 5 (20%) of neonates were the age of in between 15-21 days. whereas in the control group, 18 (72%) of neonates were under the age of 0- 7 days,5(20%) of neonates were under the age of in between 8-14 days and 2 (8%) of neonates were the age of in between 15-21 days. Distribution of neonates according to the diagnosis shows that, In experimental group 2(8%) of neonates were diagnosed with Subconjunctival hemorrhage,2 (8%) conjunctivitis and 2 (8%)napkin rash whereas, 6 (24%) of neonates diagnosed with Hyperbillirubinemia, 4(16%) of neonates diagnosed with feeding intolerance and 7(28%) of neonates diagnosed with respiratory distress syndrome. While in control group 11 (44%) of neonates diagnosed with respiratory distress syndrome, 6(24%) of neonates diagnosed with neonatal Hyperbillirubinemia, 5(20%) diagnosed with feeding intolerance,2 (8%) of neonates diagnosed with napkin rash and 4% of neonates conjunctivitis.

Table 2. Assessment of pain level of neonates undergoing venipuncture in the control group

Level of pain score	Score Range	Level of Level of pain score	
		No of neonates	Percentage
No Pain	0	0	0
Mild	1-4	0	0
Moderate	5-8	12	48
Severe	9-12	13	52
Minimum score		7	
Maximum score		10	
Mean pain score		8.48 ± 0.91	
Mean % pain score		70.66 ± 7.65	

Figure 1: Assessment of pain level score in control group

Distribution of neonates according to gender,48% of neonates in control group and 44% in experimental group were males and 52% in control group and 56% in experimental group were females. Distribution of neonates according to time gap between last feed and procedure shows that in control group 5 (20%) of neonates took last feed within half an hour where in experimental group 5 (20%) of neonates took last feed within half an hour before the initiation of procedure (venipuncture) whereas in experimental group 3(12%) of neonates took last feed within 30 mins -1hr before beginning of procedure (venipuncture). 5(20%) of neonates in control group took last feed within 1-2 hr while in experimental group 13 (52%) of neonates took last feed within 1-2 hours of initiation of procedure (venipuncture) while 8(32%) of neonates in control took last feed before 2 hours of procedure(venipuncture) whereas in experimental group 4(16%) of neonates took last feed before 2 hours of procedure.

Table 3. Assessment with of pain level score in experimental group

Level of pain score	Score Range	Level of Level of pain score	
		No of neonates	Percentage
No Pain	0	0	0
Mild	1-4	20	80
Moderate	5-8	5	20
Severe	9-12	0	0
Minimum score		1	
Maximum score		6	
Mean pain score		3.28 ± 1.51	
Mean % pain score		27.33 ± 12.61	

Figure 2: Assessment of pain level score in Experimental group

Table 4. Assessment of effectiveness of oral dextrose on altering the pain level during venipuncture among the neonates

Group	Mean	SD	Mean Difference	t-value	p-value
Control Group	8.48	0.91	5.20±0.35	14.68	0.0001 S,p<0.05
Experimental Group	3.28	1.51			

Figure 3: Significance of difference between pain score in Control and Experimental group of neonates

The above table shows that 48% of the neonates had moderate level of pain score and 52% had severe level of pain score. Minimum pain score in was 7 and maximum pain score was 10. Mean pain score was 8.48 ± 0.91 and mean percentage of pain score was 70.66 ± 7.65 . The above table shows that 80% of the neonates had mild level of pain score and 20% had moderate level of pain score. Minimum pain score in was 1 and maximum pain score was 6. Mean pain score was 3.28 ± 1.51 and mean percentage of pain score was 27.33 ± 12.61 . This table shows the comparison of pain score of neonates in control and experimental group. Mean, standard deviation and mean difference values are compared and student's unpaired 't' test is applied at 5% level of significance. The tabulated value for $n=50-2$ i.e. 48 degrees of freedom was 2.00. The calculated 't' value i.e. 14.68 is higher than the tabulated value at 5% level of significance for overall pain score of neonates which is statistically acceptable level of significance and $p=0.0001$ which is less than 0.05. Hence it is statistically interpreted that the oral dextrose on altering the pain level during venipuncture among the neonates was effective.

DISCUSSION

Distribution of sample after the comparison of pain score of neonates in control and experimental group.

Mean, standard deviation and mean difference values are compared and student's unpaired 't' test is applied at 5% level of significance. The tabulated value for $n=50-2$ i.e. 48 degrees of freedom was 2.00. The calculated 't' value i.e. 14.68 are much higher than the tabulated value at 5% level of significance for overall pain score of neonates which is statistically acceptable level of significance and $p=0.0001$ which is less than 0.05. Hence it is statistically interpreted that the oral dextrose on altering the pain level during venipuncture among the neonates was effective. The association of pain score with age in days of neonates. The tabulated 'F' values was 3.44($df=2,22$) which is much less than the calculated 'F' i.e. 9.09 at 5% level of significance. Also the calculated 'p'=0.001 which was much less than the acceptable level of significance i.e. 'p'=0.05. Hence it is interpreted that age in days of neonates is statistically associated with their pain score

REFERENCES

- Anand KJS, Corr DB.(1989) The neuroanatomy, neurophysiology and neurochemistry of pain, stress and analgesia in newborns and children. *Ped Clin N AM*; 36:795-818
- Basavanthappa BT. Paediatrics'/ Child Health Nursing. Ahuja Publishing house .1st edition. 2005; 6-8
- Basavanthappa BT. Paediatrics'/ Child Health Nursing. Ahuja Publishing house.1st edition. 2005; 6-8
- Ghai O.P, Vinod K Paul, Arvind Bagga. (2009) GHAI Essential paediatric. 7th edition..
- Guha KD. (2006) Practical newborn critical care nursing. Jaypee, Medical Publishers.1st edition : New Delhi; 40-52.
- Jane w Ball, Ruth C. Bindler. (2009) Paediatric nursing care for children. 4th edition..
- Owem ME (1979) Pain terms: a list with definitions and notes on usage. Recommended by the IASP subcommittee on taxonomy. *Pain*; 6: 249
- Taddio A, Katz J, Ilersich AL, Koren G. (1997) Effect of neonatal Circumcision on pain response during subsequent routine vaccination. *Lancet*; 349:599-603