

A Study to Assess the Effectiveness of Helfer Skin Tap Technique on Pain During Intramuscular Injection Among Neonates Born in Labour Room of a Selected Tertiary Level Hospital, UP

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Abstract: Pain is a common and a ubiquitous sensation for children and adult. Every child has his or her own perception of pain. Routine immunizations are the most frequent painful medical procedure during childhood. A fundamental principle of responsible medical care is 'do not hurt' but 'do not harm' since pain is harmful to children, the care givers are committed in preventing harm to their patients. Pain is a major source of distress for children and their families as well as health care providers. Skin tapping (Helfer skin technique) is one of the methods which keeps the muscles relaxed and thus reduce pain while administering IM injection. Objective is to assess the pain level of neonate during intramuscular injection with usual standard technique. To assess the pain level of neonate during intra muscular injection with Helfer skin tap technique and to compare the pain level of neonates during intramuscular injection with and without the use of Helfer skin tap technique. **Materials and Methods:** Study design used is True experimental post test control design. Study setting includes Labour room in a selected tertiary care hospital. Study population is 100 new born babies. Sampling technique used is Purposive sampling to select the eligible population and simple random sampling is used to allocate the subjects into experiment and control group. Tools used include Neonatal Infant Pain Scale (NIPS). **Results:** The data collected was analyzed using descriptive and inferential statistics. The study findings high lights that 86 % of the neonates in the experimental group had mild pain, only 14% perceived severe pain during IM injection by using helfer skin tap technique. 86 % of the neonates in the control group had severe pain, only 14% perceived moderate pain during IM injection by using conventional routine technique. There is a significant decrease in the pain score between the administration of IM injection with helfer skin tap technique with $p < 0.05$. This study explored the effect of helfer skin technique (rhythmic tapping) over the skin before and during IM injection in relation to pain. The present study findings supported that there is a significant difference in the pain score in the IM administration with Helfer skin tap technique. This reduction in pain results in the better adaptation of neonates into the extra uterine environment.

Keywords: Helfer skin tap technique, labour room, new born babies

1. Introduction

Pain is a common and a ubiquitous sensation for children and adult. Every child has his or her own perception of pain. The world health organisation estimates that 12 billion injections are given annually and that approximately 5% are childhood vaccinations. Vaccine injections are the most common reason for iatrogenic pain in childhood. With the steadily increasing number of recommended vaccinations, there has been a concomitant increase in concern regarding the adequacy of pain management. A fundamental principle of responsible medical care is 'do not hurt' but 'do not harm' since pain is harmful to children, the caregivers are committed in preventing harm to their patients. Research studies shows that immunization is a stressful experience for children as well as parents. During the clinical experience, the investigator found that vaccine administration causes iatrogenic pain in children. The investigator also felt that there is a paucity of studies in this area in Indian setup. Considering all the above facts the investigator found that it is very essential to conduct this study to determine the effectiveness of Helfer skin tap technique on reducing intramuscular injection pain in children.

2. Problem Statement

A study to assess the effectiveness of Helfer skin tap technique on pain during intramuscular injection among neonates born in labour room of a selected hospital, UP.

3. Objectives of the Study

- 1) To assess the pain level of neonate during intramuscular injection with usual standard technique.
- 2) To assess the pain level of neonate during intra muscular injection with Helfer skin tap technique.
- 3) To compare the pain level of neonates during intramuscular injection with and without the use of Helfer skin tap technique.

4. Operational Definitions

Helfer Skin Tap Technique: - It is a technique in which the investigator tapping over the intramuscular injection site with the palmer aspect of fingers 16 times before insertion and 3 counts during the procedure.

4.1 Assumptions

1. Every child is unique and responds in a unique way to painful procedure.
2. Helfer skin tap technique may have effect on reducing pain during IM injection.
3. Relaxation of the muscle may reduce the pain.

4.2 Delimitations

The study is limited to term new born babies delivered in labour room of a selected tertiary care hospital only. The study is limited to term neonates with Apgar score more than 9/10 at 5 minutes only. The study is limited to the neonates whose mothers are willing to participate in the study.

4.3 Scope of the Study

Findings of the study will help to determine the effect of Helfer skin tap technique in reducing pain during IM injection. This can be implemented by the health personnel while administering the injection. Reduction in pain during IM injection would enhance ease of immunization.

4.4 Hypothesis

Ho: There is no difference in the pain level between Helfer skin tap technique and usual standard technique during intramuscular injection among children at 0.05 level of significance.

4.5 Ethical Aspect

The study has been conducted maintaining the ethical standards as per the human rights guidelines for nurses in clinical and other research. This research study has been approved by the institutional ethical committee of the hospital. The prerequisites were fulfilled and the permission to conduct the study was obtained from the selected hospital. The concerned authorities and department in charges were informed about the study.

5. Review of Literature

The literature review for the present study has on the pain experience of children undergoing immunization and management of injection pain in children.

A randomised controlled trial was conducted in Canada to compare the acute pain response of infant during immunization using a slow standard of care injection versus rapid pragmatic technique in 113 infants (4-6 months). The intervention given for slow standard of care group was slow aspiration prior to injection then slow withdrawal. In pragmatic group, no aspiration done and rapidly inject the vaccine and withdraw the needle. Immediate infant pain was measured by the modified behaviour pain scale (MBPS) and visual analogue scale by parent. Mean MBPS score were higher for standard group (5-6) compared to pragmatic group (3-3) [$p < 0.001$].

An experimental study was conducted in Turkey to compare pain responses of children who receive intramuscular (IM)

vaccination in deltoid muscle versus the pain responses of those who receive IM vaccination in the vastus lateralis. A total of 185 infants were randomly assigned to one of the two study groups. The deltoid group and the vastus lateralis group were vaccinated respectively in the deltoid muscle and the vastus lateralis. The results indicated that pain response of infants was similar in each group. Crying duration of the children who received the vastus lateralis vaccination was shorter than that of the deltoid group after the procedure.

A quasi experimental study was conducted in St. John's medical college, Bangalore to determine the effectiveness of Helfer skin tap technique on pain during intramuscular injection among adult patients. There were 60 subjects received four injections in which two injections with standard technique and two injection with helper skin tap technique. Pain assessment was done by 6-10 numerical intensity pain scale. The mean pain score using Helfer skin tap technique (15 +/- 1.1) was less than the pain scored by standard technique (2.9 +/- 1.9). The pain level was significantly reduced in treatment group ($p < 0.001$)¹³.

This extensive review has helped the investigator to have a deep insight into the problem under study and has guided the investigator in the development of research instruments, data collection procedures and plan of data analysis.

6. Research Approach

Experimental design was selected considering it as the most appropriate in view of the nature of the problem and to accomplish the objectives of the study.

6.1 Research Design

The research design is the structural framework for the study implementation. In order to ensure validity of the study, true experimental post test only design was adopted to assess the pain scale of neonates during intramuscular injection. Composed of two randomly assigned groups, i.e., experimental and control, but neither of which is pretested before the implementation of treatment on the experimental group. Treatment is implemented on the experimental group only but post test observation is carried out on both the groups to assess the effect of manipulation. This design can be helpful in situations where it is not possible to pre test the subjects.

The present interventional study included randomization where the selected subjects for the study were assigned randomly to the interventional and control group. The intervention done for the interventional group was administering IM injection after giving helper skin tapping and in the control group, the routine method of giving injection was followed.

6.2 Sampling Technique

The investigator used purposive sampling to select study subjects who fulfil the inclusion criteria. Simple random sampling technique (Lottery method) was used to allocate the neonates into experimental and control group.

6.3 Sample Size

Based on previous studies sample size was calculated 100. (50 in experimental and 50 in control group)

Inclusion criteria

1. Neonates born in selected labour room..
2. Neonates available for sampling during data collection period.

Exclusion criteria

1. Preterm neonates
2. Health care professionals
3. Neonates with any complications such as birth asphyxia , IUGR, or any other medical or surgical conditions.

6.4 Variables under study

Independent variable: In this study tapping technique (method of administration of IM injection)

Dependent variable

The dependent variables in this study is pain level during IM injection Demographic variables

6.5 Tool preparation

Collection of appropriate information which provides necessary data for the study is an important aspect of any research. A thorough review of research and non research literature was undertaken to decide on the tools to be used for data collection based on the objectives of the study. Investigator has interview with medical officers, nursing officers to identify the areas of importance.

7. Neonatal Infant Pain Scale (NIPS)

The Neonatal Infant Pain Scale (NIPS) is a behavioural assessment tool for measurement of pain in preterm and full-term neonates. This can be used to monitor a neonate before during and after a painful procedure such as veni puncture. It was developed at the Children's Hospital of Eastern Ontario. Parameters:

- (1) Facial Expression
- (2) Cry
- (3) Breathing Patterns
- (4) Arms
- (5) Legs
- (6) State of Arousal

Parameter	Finding	Points
Facial expression	relaxed	0
	grimace	1
Cry	no cry	0
	whimper	1
	vigorous crying	2
Breathing patterns	relaxed	0
	change in breathing	1
Arms	restrained	0
	relaxed	0
	flexed	1
	extended	1
Legs	restrained	0
	relaxed	0
	flexed	1

	extended	1
State of arousal	sleeping	0
	awake	0
	fussy	1

7.1 Neonatal Infant Pain Scale (NIPS)

Interpretation:

- minimum score: 0
- maximum score: 7

7.2 Pilot study

After accordance of the ethical committee clearance, the pilot study was conducted on 10 neonates. Feasibility of the study was determined by assessing the availability of deliveries during the data collection period. The tool was found to be satisfactory in terms of clarity and ease of administration. The investigator then proceeded for the final study.

7.3 Method of data collection

After getting permission from the hospital administration, medical superintendent, nursing superintendent, HOD of paediatric medicine department study conducted.

- Children were identified as per inclusion criteria.
- After identifying the injection site tapped the skin 16 times approximately 5 seconds with the palmer aspect of the dominant hand to relax the muscle.
- After preparing the skin with alcohol uncapped the syringe in the dominant hand make a "V" with the thump and tapped the skin again for 3 times.
- Inserted the needle into the antero- lateral aspect of thigh. After aspirating to prevent injection into vessel as per normal routine injected the medication slowly while continuing to tap muscle gently to keep it relaxed.
- Removed the needle while simultaneously tapping the skin again using "V" tap (spreading the thumb and index finger) with non dominant hand.
- Procedure was video recorded and pain assessment was done by using NIPS scale by an observer selected for the study.

8. Analysis & Interpretation of data

Scheme of statistical analysis was as follows:

Section I : Analysis of data according to baseline variables of study subjects

Section II: Assessment of pain level during intramuscular injection among experimental and control group

Section III: Comparison of the pain level of neonates during intramuscular injection with Helfer skin tap technique and using conventional methods.

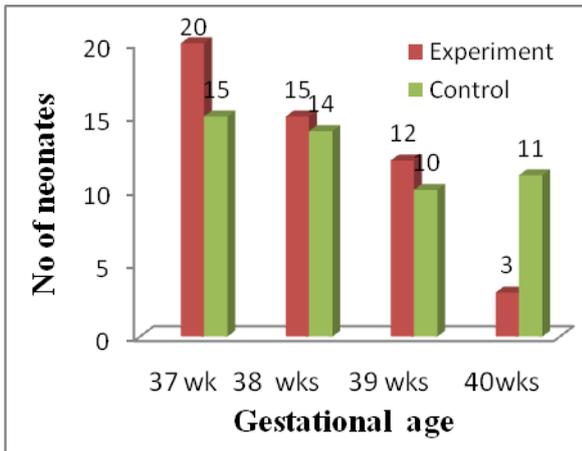


Figure 1: Gestational age wise distribution of neonates in experiment and control group

Fig 1 shows that 40% of Experimental group has completed 37 wks of gestation and 30% , 38 wks of gestation, 24 % 39 wks of gestation and 6% 40 wks of gestation. Among Control group neonates 30% were 37 wks , 30% 38 wks and the 35% were 39 – 40 wks of gestational age.

Table1: Sex wise distribution of neonates in experiment and control group

Sex	Experiment	Control	Total
Male	19	23	42
Female	31	27	58
Total	50	50	100

Tab1 shows that majority were female babies in both control and experimental group

Table 2: Assess the pain level during intramuscular injection in experiment group

Pain score	Experiment
Mild (1 – 2)	43
Moderate (3 – 5)	0
Severe (6 – 7)	7

No (0)	0
Total	50

86 % of the neonates in the experimental group had mild pain, only 14% perceived severe pain during IM injection by using helper skin tap technique.

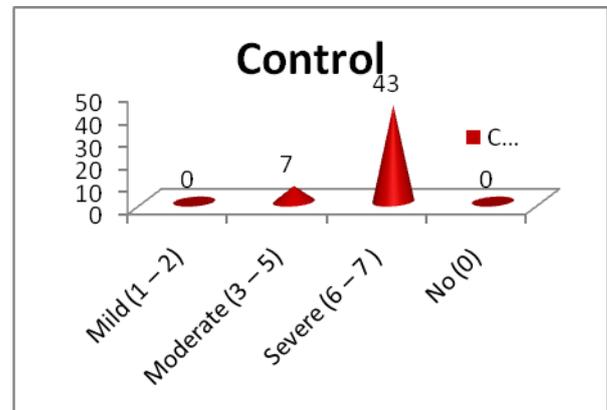


Figure 2: Assess the pain level during intramuscular injection in control group

86 % of the neonates in the control group had severe pain, only 14% perceived moderate pain during IM injection by using conventional routine technique.

Table 3: Area wise comparison of pain level in experiment and control group

Area	Experiment (n=50)		Control (n=50)		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Face	0.4	0.5	1	0	3.23	<0.05
Cry	1.15	0.37	1.85	0.37	3.77	<0.05
Breathing	0.15	0.37	0.85	0.37	3.77	<0.05
Arms	0.15	0.37	1	0	4.58	<0.05
Legs	0.15	0.37	1	0	4.58	<0.05
State of arousal	0.15	0.37	1	0	4.58	<0.05

(1.96)

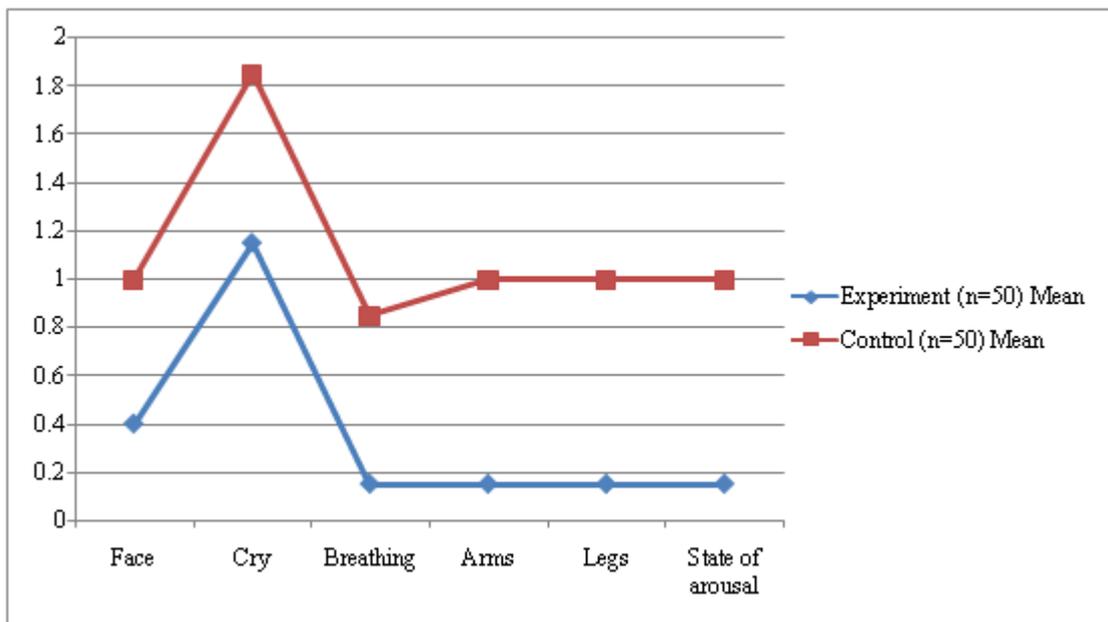


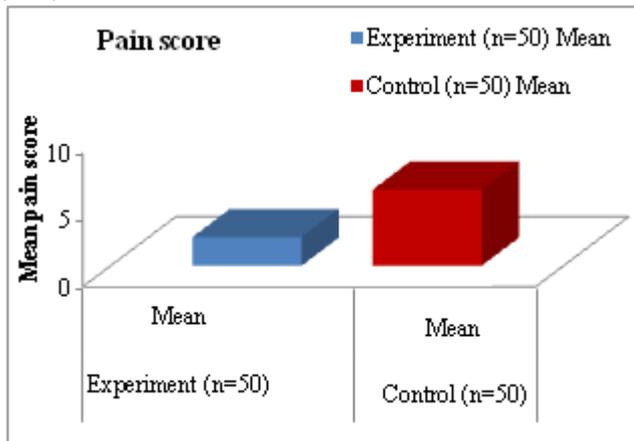
Figure 6: Area wise comparison of pain level in experiment and control group

There is a significant difference in the pain score between the administration of IM injection with or without helper skin tap technique with $p < 0.05$.

Table 4: Comparison of pain level in experiment and control group

Parameter	Experiment (n=50)		Control (n=50)		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Pain score	2.15	2.01	5.7	0.73	4.003	<0.05

(1.96)



There is a significant difference in the pain score between the administration of IM injection with or without helper skin tap technique with $p < 0.05$.

9. Findings of the Study

- 40% of Experimental group has completed 37 wks of gestation and 30% , 38 wks of gestation, 24 % 39 wks of gestation and 6% 40 wks of gestation. Among Control group neonates 30% were 37 wks , 30% 38 wks and the 35% were 39 – 40 wks of gestational age.
- Majority were female babies in both control and experimental group
- 86 % of the neonates in the experimental group had mild pain, only 14% perceived severe pain during IM injection by using helper skin tap technique.
- 86 % of the neonates in the control group had severe pain, only 14% perceived moderate pain during IM injection by using conventional routine technique
- There is a significant difference in the pain score between the administration of IM injection with or without helper skin tap technique with $p < 0.05$.

10. Hypothesis testing

- Ho (1) : There is no difference in the pain level between Helper skin tap technique and usual standard technique during intramuscular injection among children at 0.05 level of significance.
- **Null hypothesis is rejected with 0.05 level of significance**

Implications of the study

The result of this study have several implications for the nursing professionals, including nursing practice, nurse education, nursing research and nursing administration.

11. Limitations of the Study

The present study had the following limitations:

1. The study was conducted on a limited number of neonates (100) only for a period of eight weeks..
2. The study is limited to term neonates without any other complications
3. Broad generalization cannot be made due to limited area of setting and limited sample size.

12. Recommendations

- A similar study can be conducted in a broader area in order to draw generalization
- A similar study can be conducted in different settings and in a large group.
- A study can be conducted in term and preterm babies and results can be compared.
- A study can be conducted incorporating continuous vital parameters monitoring while administering IM injections.

13. Conclusion

Pain is a major source of distress for children and their families as well as health care providers. It is an accepted fact that there is reduced pain in giving injection into a relaxed muscle. Tapping over the skin is one of the various techniques to keep the muscles relaxed. This study explored the effect of helper skin technique (rhythmic tapping) over the skin before and during IM injection in relation to pain.

The present study findings supported that there is a significant difference in the pain score in the IM administration with Helper skin tap technique. This reduction in pain results in the better adaptation of neonates into the extrauterine environment.

In conclusion findings of this study strongly emphasis the importance of making helper skin technique is a compulsory step in IM injection and thus we can reduce agony of our patients. The standards for nursing care clearly supports a holistic care of our clients.

References

- [1] Mcgrath Pain in children. New York: Guit fort publications; 1990. P. 3
- [2] Taddio A, chamber CT, Inadequate pain management during routine childhood immunization: Clinl therazr(B). 2009;151-63.
- [3] Ball J W, Binder C, Text book of paediatric nursing. 4thedn. New Delhi: Pearson education;2001.p. 470.
- [4] Kyle T .Essential peditric nursing, New Deihi:Lppincot William; 2009.P. 380
- [5] Good enough B, Perrot P A,Dangen K V, Brouwer. Children's response to vaccine fluid injection vs needle puncture pain during routine immunisation. ambulatory child health.6 (2).2008. 91-100
- [6] Broome ME, Endsley R. Parent and child behaviour during immunisation. Pain.21989.37(1): 85-92

- [7] IPP Morhe. Vaccine related pain: randomised controlled trail of injection technique. Arch.Dis child.2007; 92(12) : 1105-08.
- [8] Mukash K. A study to compare the effectiveness of two distraction techniques in altering behaviour responses to pain among children (1-3 years) receiving immunization. 2006
- [9] Celeblugiea a,Akpinar R B, Tesel A .Appl nus research.2010may;23(2):101-5
- [10].Pira T, Champion-D, Bustoso T, Donnelly, Factors associated with infant pain response following an immunization injection. Early humandevelopment.2007may;83(5):319-26
- [12]Toddio A, Illorsich AL,IPP.M. Physical interventions and injection technique for reducing injection pain during routine childhood immunization. Systematic review of randomised controlled and quasi-randomised controlled trails. Clin ther 2009 ; 31 : 48-76
- [13]Hasanpour M, Tootoonchi M, Aein F. The effect of two non-pharmacological pain management methods for intramuscular injection pain in children. Jnl of pain and symptom management. 1995Nov;10(8):584-90
- [14]Georg J. A study to assess the effectiveness of Helfer skin tap technique on pain during intramuscular injection among adult patients. 2007
- [15]Cowie A P .Oxford Advanced learner's Dictionary of English.4th ed .Oxford university press;1989.p.385
- [16]Joannehelfer.Painless Injections: Helfer Skin Tap Technique. Nurse Educator. 2000; 25(6):272-3.
- [17]Linda.Painless injections. Nursing for nurse. 1998 september 25; Available from: URL:http://www.all nurses.com.
- [18]Krusezeuskp Az, Lany SH, Johnson JE. Effect of positioning on discomfort from Intra muscular injections in the dorsogluteal site. Nursing Research. 1979 march – Apr; 28(2): 103-5.
- [19]Chung JW, Ng WM, Wong TK. An experimental study on the use of manual pressure to reduce in Intra muscular injection. J pain symptom manage. 1996 Jul ;12(1):52-8.
- [20]BarnhillBJ, HolbertMD, JacksonNM, EricksonRS. Using pressure to decrease the pain of IM injections. nursing Research .2000.
- [21]RomanoCL, CeccaE. A new method to reduce Pin – Prick pain of Intra muscular and subcutaneous injections. Aneasthesia analogue. 2004 Dec; 99 (6).
- [22]Keen, Mary Frances. Comparison of IM injection technique to reduce site discomfort and lesions. nursing Research. July 1986; 35(4): 207 –10.
- [23]DonaldsonC, Green.J. Using the ventrogluteal site for Intra muscular injection. Nursing times. 2005 Apr; 19-25: 101 (16).
- [24]PuntilloK, NeighborM, O'NeilN. Accuracy of emergency nurses in assessment of patient's pain. Pain management nursing. 4(4):171-5.
- [25]WiseEA, PriceD. Gender role expectations of pain. Relationship to experimental pain perception. 96(3): 335-42.
- [26]PaseroC. Pain and comfort issue. journal of peri-anaesthesia nursing.19(3): 135-7.
- [27]MiaskowskiC. The impact of age on a patients perception of pain and ways it can be managed. Pain management nursing. 1(3): 51-7.
- [28]MelszckR. Gate control theory on the evolution of pain concepts. Pain forum. 5(1): 128-38.