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.
The concerned authorities and department in charge were to conduct the study was obtained from the selected hospital. The prerequisites were fulfilled and the permission approved by the institutional ethical committee of the 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 helfer 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).

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 helfer 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 fulfils 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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Finding</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial expression</td>
<td>relaxed</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>grimace</td>
<td>1</td>
</tr>
<tr>
<td>Cry</td>
<td>no cry</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>whimper</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>vigorous crying</td>
<td>2</td>
</tr>
<tr>
<td>Breathing patterns</td>
<td>relaxed</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>change in breathing</td>
<td>1</td>
</tr>
<tr>
<td>Arms</td>
<td>restrained</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>relaxed</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>flexed</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>extended</td>
<td>1</td>
</tr>
<tr>
<td>Legs</td>
<td>restrained</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>relaxed</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>flexed</td>
<td>1</td>
</tr>
</tbody>
</table>

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.

Table 1: Sex wise distribution of neonates in experiment and control group

<table>
<thead>
<tr>
<th>Sex</th>
<th>Experiment</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>19</td>
<td>23</td>
<td>42</td>
</tr>
<tr>
<td>Female</td>
<td>31</td>
<td>27</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Pain score</th>
<th>Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild (1 – 2)</td>
<td>43</td>
</tr>
<tr>
<td>Moderate (3 – 5)</td>
<td>0</td>
</tr>
<tr>
<td>Severe (6 – 7)</td>
<td>7</td>
</tr>
</tbody>
</table>

86% of the neonates in the experimental group had mild pain, only 14% perceived severe pain during IM injection by using heller 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

<table>
<thead>
<tr>
<th>Area</th>
<th>Experiment (n=50)</th>
<th>Control (n=50)</th>
<th>MW test ZP Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Face</td>
<td>0.4</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Cry</td>
<td>1.15</td>
<td>0.37</td>
<td>1.85</td>
</tr>
<tr>
<td>Breathing</td>
<td>0.15</td>
<td>0.37</td>
<td>0.85</td>
</tr>
<tr>
<td>Arms</td>
<td>0.15</td>
<td>0.37</td>
<td>1</td>
</tr>
<tr>
<td>Legs</td>
<td>0.15</td>
<td>0.37</td>
<td>1</td>
</tr>
<tr>
<td>State of arousal</td>
<td>0.15</td>
<td>0.37</td>
<td>1</td>
</tr>
</tbody>
</table>

(1.96)
There is a significant difference in the pain score between the administration of IM injection with or without Helfer skin tap technique with p <0.05.

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

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Experiment (n=50)</th>
<th>Control (n=50)</th>
<th>MW test</th>
<th>Z Value</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain score</td>
<td>Mean 2.15, SD 2.01</td>
<td>Mean 5.7, SD 0.73</td>
<td>4.003</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

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

9. Findings of the Study

- 40% of Experimental group has comleted 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 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 difference in the pain score between the administration of IM injection with or without Helfer skin tap technique with p <0.05.

10. Hypothesis testing

- Ho (1) : 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.
- 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 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 extrauterine environment.

In conclusion findings of this study strongly emphasis the importance of making Helfer 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


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