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Effect of Helfer Rhythmic skin tap technique on procedural pain among patients receiving intramuscular injection

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Original article

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Abstract

Objective: The present study aims at comparing the effect of Helfer Rhythmic Skin Tapping Technique (HST) and Conventional Technique (CT) on pain perception of patients receiving IM injection. **Methods**: Quasi-experimental two groups, interventional study using cross over design was conducted at orthopaedic wards of Govt. Medical College Kozhikode, Kerala from May 2 – 21, 2011. A total of 82 patients admitted in orthopaedic wards, in the first post-operative day after orthopaedic surgery, who were receiving Inj. Voveran were included. After informed consent, subjects were purposively selected to Group I and II. The tools used were, (a) Interview schedule to assess socio demographic and clinical data, (b) Brief Pain Inventory to measure pre-procedure pain intensity and interference, (c) Anxiety Scale to identify the pre-procedural anxiety, (d) Numerical Pain Intensity Scale and Visual Analogue Scale to assess pain during intervention. Data were analysed by SPSS- version 15 and relevant descriptive, inferential statistics were computed. **Result:** There is significant reduction in pain perception scores of patients receiving IM injection with HST, compared to that with CT. There is no association between pain perception scores of subjects receiving IM injection with HST and selected socio demographic variables. The association between anxiety and pain perception scores of subjects receiving IM injection with HST is found to be negligible. **Conclusion:** Evidently, this study shows that the use of HST is highly effective in reducing pain perception during IM injection. By practicing this technique routinely nurses can contribute to improve patient's comfort level by reducing the interventional pain.

Key Words: Helfer Rhythmic Skin Tapping Technique (HST), Conventional Technique (C T), IM injection, Interventional pain, orthopaedic surgery, Anxiety.

Introduction

Pain is a complex phenomenon, and its exact nature remains a mystery. A person in pain often experiences it as an all-consuming reality and wants only one intervention- pain relief. Pain is purely subjective sensation. Many factors influence pain perception of a person at a given moment. When an individual is exposed to pain, almost anything can influence as to how the painful stimulus is transmitted to the brain, how it is perceived and the responses made to it. Socio-cultural factors like race, culture and ethnicity are critical variables which affect pain perception of an individual as it dictates our daily behaviour, attitudes and values. Other related factors which influence the pain perception are family (Warfield, 2002), gender (Criste, 2002), age, anxiety and previous pain experiences. During hospitalisation, the patients need to undergo a variety of painful interventions like injections and other invasive procedures. As the patient is already under stress due to their ill health, the health care professionals try to reduce discomfort with these painful procedures. In health care settings, pain management is one of the main facets of nursing care, where nurses need to be competent. Nurses are obligated to mitigate every kind of pain, including the "minor" procedural pain.

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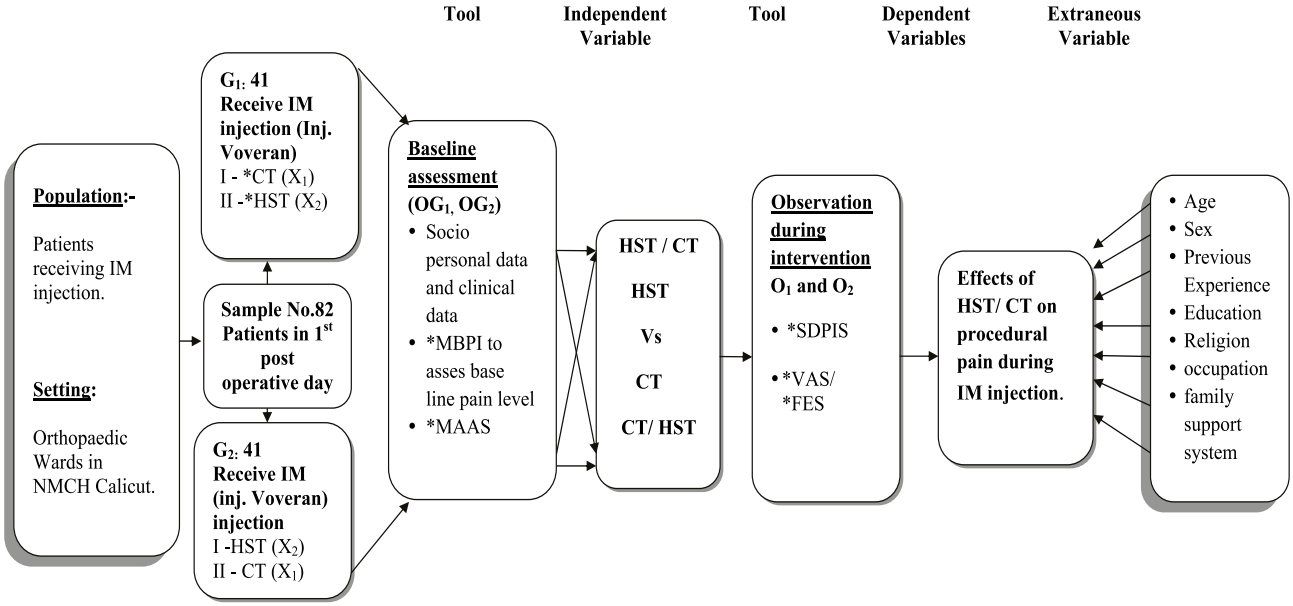
Undoubtedly, procedural pain is an important source of discomfort for hospitalised patients from which, all instinctively try to escape. Intramuscular (IM) injection is one of such procedure and a common one that nurses frequently carry out, which causes pain and distress to the recipient. Most of the analgesics are given intramuscularly, but patients with various types of pain often reject the analgesics because of expected procedural pain. They often report, existing pain is better than the pain due to IM injection (Keen, 1986). Hence, this study is exploring the effect of 'rhythmic tapping' over the skin before and during IM injection in relation to pain (Helfer, 2000).

Materials and Methods

The setting selected for the study was orthopaedic wards of Medical College Hospital Kozhikode. To accomplish the objectives of the study, quasi experimental, cross over design was used. The patients admitted in orthopaedic ward, who were between the age group of 20 and 60 years, in the first post-operative day after orthopaedic surgery receiving Inj. Voveran via IM route and able to follow written and verbal instructions were included as the population for the study. Clients having cardiovascular problems or diabetes mellitus and neurovascular impairment of the extremity, at the ventro gluteal site were excluded from the study. Eighty two samples were selected using purposive sampling technique.

After obtaining informed consent, they were purposefully selected to Group I and Group II in the order of admission. Prior to the intervention, subjects were interviewed to obtain socio demographic and clinical data, assessed with Modified Brief Pain Inventory to measure preprocedure pain intensity and interference, and Anxiety Assessment Scale to identify the preprocedural anxiety. Being the crossover design, the subjects in the first group received Inj. Voveran intramuscularly with Conventional Technique (CT) (early morning dose on the first postoperative day, after wearing off the effects of anaesthesia) and subjects in the second group received Inj. Voveran intramuscularly with HST (early morning dose in first post-operative day, after wearing off the effects of anaesthesia) initially and interventions were cross over later (after 8 hours in the same day). During the initial and later interventions subject's pain perception was assessed using Simple Descriptive Pain Intensity Scale and Visual Analogue Scale. (Figure 1&2).



* **CT**- conventional technique, ***HST**- Helfer Rhythmic Skin Tap Technique, ***MBPI:** Modified Brief Pain Inventory, ***MAAS:** Modified Anxiety Assessment Scale, ***SDPIS:** Simple Descriptive Pain Intensity Scale, ***VAS:** Visual Analogue Scale, ***FES:** Facial Expression Scale.

Figure 1: Schematic representation of Study design

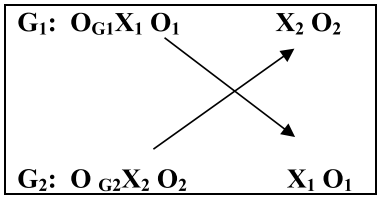


Figure 2: Cross over design used for the study

G_1: Study group, who receive IM injection with CT first

G_2: Study group, who receive IM injection with HST first.

X_1: Administration of IM injection using CT.

X_2: Administration of IM injection using HST.

O_{G1}: Base line assessment for G_1, as measured by interview schedule to assess socio demographic and clinical data, Modified Brief Pain Inventory MBPI to assess preprocedure pain intensity and interference, and Modified Anxiety Assessment Scale MAAS to assess preprocedural anxiety.

O_{G2}: Base line assessment for G_2, as measured by interview schedule to assess socio demographic and clinical data, MBPI to assess preprocedure pain intensity and interference, and MAAS to assess preprocedural anxiety.

O_1: Assessment of pain perception of patients during IM injection with CT.

O_2: Assessment of pain perception of patients during IM injection with HST.

Techniques for Administration of IM Injection

Conventional Technique

IM injection with CT performed during early morning hour of 1st post operative day for subjects in Group I and during noon hours (eight hours after the IM injection with HST) for subjects in Group II.

1. Place the patient in a comfortable position. For giving injections in the ventro gluteal site, place the client in a side-lying position, knees should be flexed.
2. After preparing the skin, uncap the syringe in the dominant hand. Make a large V with the thumb and index finger of the nondominant hand.
3. Insert the needle at a 90[degrees] angle into the muscle.
4. Inject the medication slowly into the muscle after aspirating to avoid medicine into the vein.
5. Remove the needle, and press the area gently.

Helfer Rhythmic Skin Tap Technique (Helfer, 2000)

This technique uses basic concepts of theory of pain; including the gate control theory. Mechanical stimulation of the large-diameter muscle fibers diminishes the influence of small, pain-carrying fibers. There are two basic points: muscle relaxation, which physically decreases the resistance to needle entry, and diversion, by simultaneous Tap of the skin while the needle is inserted and removed. The procedure is as follows:

1. For injections into the ventro gluteal site, have the client in a side-lying position, with the knees flexed.
2. After identifying the injection site, tap the skin several times with the palmar aspect of the fingers of the dominant hand for approximately five seconds to relax the muscle.
3. After preparing the skin with alcohol, uncap the syringe in the dominant hand. Make a large V with the thumb and index finger of the nondominant hand and tap the skin again. The entire hand is used to tap the muscle three times. The tap (not slap) must be firm, using the entire hand, to ensure stimulation of the large fibers.
4. On the count of three, simultaneously insert the needle like a dart at a 90[degrees] angle into the muscle.
5. After aspirating to prevent injection into a vessel as per normal routine, inject the medication slowly while continuing to tap the muscle gently to keep it relaxed with the palmar aspect of the fingers of the non-dominant hand.
6. Remove the needle while simultaneously tapping the skin again using the V tap (spreading the thumb and index finger) of the nondominant hand.

During injections the pain perception of the patient was assessed with Simple Descriptive Pain Intensity Scale and the pain intensity of the patient was assessed by the investigator during the procedure with Visual Analogue Scale. The collected data were analysed and organized according to the objectives of the study using descriptive and inferential statistics.

Results

Among 82 patients, 35.4 percent were of the age group between 20-30 years. The study group contained 47.6 percent males and 52.4 percent females. Half of the patients belonged to the Hindu religion (50%). Among 82 patients, 42.7 percent had primary education and 43.9 percent were

unemployed. All the patients (100%) had previous history of intramuscular injection.

Majority (91.5%) of patients received IM injection with CT reported moderate pain during the procedure (table1).

Table 1: Frequency and percentage distribution of subjects based on pain perception score during IM injection with CT. (n=82)

Intensity of pain	Frequency	Percentage
Mild	2	2.4
Moderate	75	91.5
Severe	5	6.1
Total	82	100

Table 1 reveals that 91.5 % of patients had moderate and 6.1% had severe pain during IM injection using conventional technique.

During IM injection with HST 78.05 % of patients reported mild pain. No patient reported severe pain during IM injection with HST (Table 2).

Table 2: Frequency and percentage distribution of subjects based on pain perception score during IM injection with HST (n=82)

Intensity of pain	Frequency	Percentage
Mild	64	78.1
Moderate	18	21.9
Severe	-	-
Total	82	100

There was no statistical association found between selected socio demographic variables like age, sex, religion, educational status and occupation and pain perception during IM injection with HST. Among patients admitted with Road Traffic Accidents (RTA), 49% belonged to the age group of 20-30. All (100%) of patients with spontaneous fractures and 50% patients with fall were in the age group of 51-60. RTA is the cause of admission in 58.2% of males admitted in orthopaedic wards; where as in females, fall and spontaneous fracture were the reason for admission among 61.1% and 100% of them respectively.

There is significant positive statistical association found between pre- procedure intensity and interference and pain perception during IM injection with HST. There is no statistical significant association between anxiety of subjects and pain perception during IM injection with Helfer Skin Tap technique (Table 3).

Table 3: Association between socio demographic variables, pre procedure anxiety levels and pain perception score during IM injection with HST

Variables	Chi squire value	df	Significance (p value)
Age	12.193	12	0.430
Sex	2.119	4	0.714
Religion	4.671	8	0.792
Educational status	12.367	12	0.471
Occupation	16.313	12	0.177
Anxiety	6.657	8	0.574

From table 3, it is inferred that as the p values are above 0.05, there is no association between selected socio demographic variables and pain perception score during IM injection with HST. And also there is no association between pain perception score during IM injection with HST and pre procedure anxiety, as the p value is more than 0.05.

Table 4: Comparison of effect of CT versus HST on procedural pain among samples during IM injection (n=82)

Technique	Mean Difference	SD	't' value	p value
CT	1.4122	0.5081	25.170	<0.001
HST				

HST was more effective in reduction of pain perception during IM injection as there was significant difference found between pain perception score of subjects during IM injection with CT and HST (p = 0.001) (Table 4).

Discussion

The findings of the present study were discussed in relation to the observations made by the other studies which the investigator reviewed. The present study used Helfer Skin Tap technique (HST) to reduce the pain perception score of patients receiving IM injection. And the pain perception during HST was compared with pain perception during conventional technique while administering IM injection. The study found that there was significant difference in pain perception score of patients receiving HST when compared with pain perception with conventional technique. This finding is consistent with the study findings of Helfer (2000); Serena, (2010) who reported the effect of HST in reducing

procedural pain during IM injection and found that the overall mean pain intensity by using HST was much lower than the pain level by conventional technique.

The present study used VAS and Simple Descriptive Pain Intensity Scale to assess the pain perception of patients during IM injections in orthopaedic patients. Briggs & Closs, (1999) used faces pain scale and numerical pain intensity scale to assess the pain perception of orthopaedic patients. The present study used skin tap to decrease pain perception during IM injection based on gate control theory. The studies conducted by Bonjar & Hashem, (2010)) and Mitchel & Whitney, (2001) support the present study as they conducted studies based on gate control theory in various settings for reducing pain perception. .The present study was based on technique to reduce pain perception of patients receiving IM injection. This is consistent with other studies conducted by Dustin, Keith, Amy, & Sheryl, (2010) regarding cough trick to manage immunization pain in children. Berberich & Landman, (2009), used multifaceted distraction techniques to reduce injection pain in children and it also supports the present study in the aspect of pain reduction techniques during injections in improving comfort of patients. The studies conducted by Lundberg, 2008; Barnhill, Holbert, Jackson, & Erickson, (1996); Cassidy, et al., 2001 and Chung, Ng, & Wong, (2002) regarding various techniques to reduce procedural pain perception during IM injection also support the present study. In the present study, there was no significant statistical association between the pain perception score of patients receiving intramuscular (IM) injection with Helfer skin Tap technique and age of patient and this finding was consistent with the findings of the study conducted by Chen, Craske, Katz, Schwartz, & Zeltzer, (2000). According to their study for evaluating the relationship between pain sensitivity and distress during lumbar puncture, there was no statistical relation between pain sensitivity and distress score and age of subjects. The present study flashed light on the fact that there were no significant association between gender of the patient and the pain perception score of patients receiving IM injection with Helfer skin Tap technique. The finding is agreed to the findings put forwarded by the study on effect of music distraction on pain perception during IV cannulation conducted by Arts, et al., 1994, who revealed that along with age factor, gender difference had no association with pain during IV cannulation.

The present study found that there were no statistical significant association between religion and the pain perception score of patients receiving IM injection with HST. This finding was consistent with the findings of the study conducted by Chen, Craske, Katz, Schwartz, & Zeltzer, (2000) According to their study for evaluating the relationship between pain sensitivity and distress during lumbar puncture, there was no significant statistical relationship between pain sensitivity and distress score and religion and ethnic back ground of subjects. The present study finding is inconsistent with the findings of study conducted by Campbell, Edwards, & Fillingim, (2005) on ethnic difference in response to multiple experimental pain stimuli. In that study they found that there were difference in pain response between African Americans and white people. In the present study 50% of subjects were Hindus, and 42.7% were Muslims and it is consistent with the population statistics of Kozhikode district. According to district census there were 18, 16,337 (58.79 %) Hindus and 11, 85,457 (38.37%) Muslims in Kozhikode.

The present study throws light on the fact that 49.1% of RTA cases were in the age group of 20-30 years. It is consistent with RTA statistics of Kozhikode district. 100% of subjects with spontaneous fracture belong to the age group of 51-60 age groups and were females. This fact is consistent with the findings of (Winzenberg, et al., 2006) in their study on femoral neck demineralization in elderly people.

In the present study there were no significant statistical association between anxiety and the pain perception score of patients receiving IM injection with HST. This was inconsistent with the study findings of Byers, Bridges, Kijek, & LaBorde, (2001), who conducted a study on burn patients to examine their pain and anxiety experience during resting and procedures. In that study, they found that there

were strong positive correlation between pain and anxiety. Ploghaus, et al., (2001) also emphasised the positive correlation of anxiety and pain perception with neurophysiologic evidence in their article "Exacerbation of pain by anxiety is associated with activity in a Hippocampal network."

Conclusion

Based on the present study, there is significant reduction in pain perception scores of patients receiving IM injection with HST, compared to IM injection with CT. There is no association between pain perception scores of subjects receiving IM injection with HST and selected socio demographic variables like age, gender, religion, educational and occupational status. The study also shows that there is no significant association between anxiety of subjects and pain perception scores of subjects receiving IM injection with Helfer skin Tap technique. So HST is more preferred than CT while giving IM injection for reducing procedural pain in any age and gender without considering the anxiety level of the patient.

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