



## EFFECT OF COLD NEEDLE INJECTION TECHNIQUE VERSUS ROUTINE INJECTION TECHNIQUE ON THE LEVEL OF PAIN AND DISCOMFORT AMONG ADULTS IN A SELECTED HOSPITAL

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### ABSTRACT

A quasi experimental post test only cross over design was used to determine the effect of cold needle injection technique and the routine injection technique on the level of pain and discomfort during intramuscular injection among 60 adult patients receiving tramadol injection. The aim of the study is to compare the level of pain and discomfort between cold needle injection technique and routine injection technique. The investigator administered the tool to the participants using Numerical Pain Rating Scale and Comfort Rating Scale. The calculated 't' value ( $t_{59}=5.15$ ) using Numerical Pain Rating was greater than the table value ( $t_{59}=2.0, p<0.05$ ) indicate that cold needle injection technique was effective in reducing the level of pain during intramuscular injection. The calculated 't' value ( $t_{59}=6.14$ ) was greater than the table value ( $t_{59}=2.0, p<0.05$ ) showed that cold needle injection technique was effective in reducing the level of discomfort during intramuscular injection.

**KEYWORDS :** Pain; Discomfort; Intramuscular injection; Cold needle; Effect

### Introduction:

The word pain comes from the Latin word 'poena' meaning fine or penalty. Pain has been identified as the fifth vital sign by Australian and New Zealand of anaesthetics. The International Association for Study of Pain (IASP) defines pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage". This definition reflects the fact that pain is a result of tissue damage (Lewis LR et al., 2007).

According to WHO injections are the most frequently used medical procedures. Each year 16 billion injections are administered in developing and transitional countries. The vast majority, around 95% are given in curative care. Immunizations accounts for around 3% of all injection. The prevalence of injections in European countries was 5.6-11.3 injections per person per year. The lowest annual numbers of injections were in America that is 1.7-1.9 injections per person per year. People residing in developing regions receive 1.5-11.3 injections per person per year. India contributes 25-30% of global injection load. In India a survey found that 96% of all injections given by private doctors were antibiotics, vitamins, analgesics. A conservative estimation of the average number of injections ranged from 0.9-8.5 per person per year (Nicoll LH, Hesby A 2002).

Comfort, a single seven letter word which denotes a positive outcome of care, is a state of being stress free and/or relief from stress or anxieties from the physical, psycho-spiritual, socio-cultural and environmental burdens. It is indeed one of our keys goals on patient care and an indicator of a safe, holistic, and ill-structured nursing care. It is the 21<sup>st</sup> Century and some life saving medical procedures still feel traumatic and tortuous. Despite the advancements made each year in the medical field, discomfort may still be a reality for patients ( Smith KC 2007).

Since a painful injection might raise severe fear which can defer patients from seeking medical care, pain originating from Intramuscular injection should not be underestimated.<sup>10</sup> Since nurses spend more time with patients with pain than other healthcare providers do, they need to understand the physiologic and psychological consequences of acute and chronic pain, and the methods to treat pain.

### Objectives of the study :

1. To determine the level of pain and discomfort of adult patients with the routine injection technique and cold needle injection technique.
2. To compare the level of pain and discomfort with routine injection technique and cold needle injection technique.
3. To find the association between the level of pain and discomfort with selected demographic variables.

### Materials and Method:

A quasi experimental post test cross over design was used to compare the level of pain and discomfort between cold needle injection technique and routine injection technique during intramuscular injection among 60 adult patients receiving tramadol injection. The participants were recruited using purposive sampling technique and lottery method was used to allocate the participants into cold needle injection technique group and routine injection technique group. Ethical clearance was obtained before starting the study. Confidentiality was assured and informed consent was taken from each participants. Numerical pain Scale and Comfort Rating Scale were administered to the participants immediately after each injection technique. The data collected was analysed using descriptive and inferential statistics.

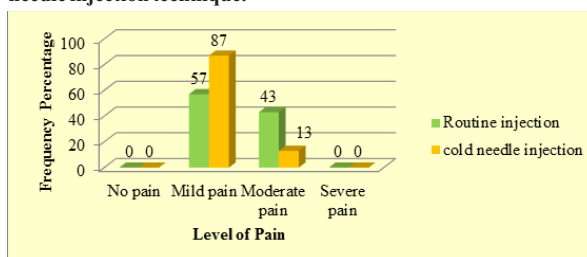
### Results:

#### Baseline variables:

Out of 60 subjects, majority 37(62%) were females and only 23(38%) were males. 54(90%) resides in rural area and only 6(10%) belongs to urban area. Data on BMI shows that majority of the subjects 41(68%) have a BMI of 18-25 and 19(32%) have a BMI of 25-30. 39(65%) have previous experienced of IM injection.

#### Determination of the Level of Pain with Routine Injection Technique and Cold Needle Injection Technique.

#### Level of pain with cold needle injection technique and routine needle injection technique.



**Figure 1: Bar Diagram Showing Distribution of Subjects According to the Pain Score**

Data in figure 1 shows that 34(57%) of the subjects had mild pain and 26(43%) had moderate pain in routine injection technique whereas in cold needle injection technique, majority of the subjects 52(87%) had mild pain and only 8(13%) had moderate pain.

#### Determination of the Level of Discomfort with Routine Injection Technique and Cold Needle Injection Technique.

The findings of the study shows that 47(78%) of the subjects experienced mild level of discomfort and 13(27%) experienced moderate level of discomfort in routine injection technique whereas in cold needle injection techniques 57(95%) experienced mild level discomfort and only 3(5%) experienced moderate level discomfort.

#### Comparison of the Level of Pain between Routine Injection Technique and Cold Needle Injection Technique.

**Table 1: Comparison of the level of pain n=60**

Level of Pain				
Techniques	Mean	MD	't' value	'p' value
Routine injection	3.43	.82	5.15	.001*
Cold needle injection	2.62			

$t_{59}=2.0, p<0.05$

\* Significant

The data in table 1 shows that the computed 't' value ( $t_{59}=6.14, p=.001$ ) is higher than the table value  $t_{59}=2.0, (p<0.05)$  which indicate cold needle injection technique is effective in reducing the level of pain during IM injection.

#### Comparison of the Level of Discomfort between Routine Injection Technique and Cold Needle Injection Technique.

**Table 2: Comparison of the level of discomfort n=60**

Level of Discomfort				
Techniques	Mean	MD	't' value	'p' value
Routine injection	30.88	4.72	6.14	.001*
Cold needle injection	26.17			

The data in table 2 shows that the computed 't' value ( $t_{59}=6.14, p=.001$ ) is higher than the table value  $t_{59}=2.0, (p<0.05)$  which indicate the cold needle injection technique is m effective in reducing the level of discomfort during IM injection.

#### Association of Level of Pain and discomfort with Selected Demographic Variables:

The study showed that all the calculated p value were greater than 0.05 ( $>0.05$ ). Thus states there is no significant association between the level of pain and discomfort with selected demographic variables.

#### Discussion:

The present study shows 34(57%) of the subjects had mild pain and 26(43%) had moderate pain in routine injection technique whereas in cold needle injection technique, majority of the subjects 52(87%) had mild pain and only 8(13%) had moderate pain using Numerical Pain Rating Scale. This is in line with the study of Farhadi A & Esmailzadeh M (2011) who found that local cold significantly decreased the severity of pain due to penicillin benzathin IM injection in case group as compared with control group. The present study shows that 47(78%) of the subjects experienced mild level of discomfort and 13(27%) experienced moderate level of discomfort in routine injection technique whereas in cold needle injection technique 57(95%) experienced mild level discomfort and only 3(5%) experienced moderate level discomfort. The mean discomfort score (30.88) in routine injection technique is higher than the mean discomfort score (26.17). Study of Keen MF (1986) shows that the Z -tract technique significantly decreased the incidence of selected descriptors of discomfort at selected time intervals.

The present study shows that the computed 't' value ( $t_{59}=6.14, p=.001$ ) is higher than the table value  $t_{59}=2.0, (p<0.05)$  which indicate cold needle injection technique is more effective in reducing the level of pain during IM injection. This finding is congruent with the findings of the study conducted by which Denkler K (2015), proved that out of 77 participants who received two injections, one with frozen needle and the other with room temperature needle, the frozen needles were less painful in 59 (76.6%) participants. The present study shows that the computed 't' value ( $t_{59}=6.14, p=.001$ ) is higher than the table value  $t_{59}=2.0, (p<0.05)$  which indicate the cold needle injection technique is more effective in reducing the level of discomfort during IM injection. This study is in congruent with the findings of the study conducted by Smith K C et al., (2007) on "Ice Minimizes Discomfort Associated with Injection of Botulinum Toxin Type A for the Treatment of Palmer and Plantar Hyperhidrosis". The result showed that during needle insertion, both the application of ice to the intended injection point followed by application of ice (or vibration) adjacent to the injection

point have been effective. Another study finding of Maiden MJ, Benton GN & Bourne RA (2003) on the effect of warming adult diphtheria-tetanus vaccine on discomfort after injection shows no significant difference in incidence of discomfort between the groups who received vaccine prepared in different ways (cold vaccine, warmed vaccine and rubbed vaccine) with a mean of 19.1, 28.9 and 26.9 and there was no significant difference in incidence of pain between the groups who received vaccine prepared in different ways at any follow up (5 min:  $p=0.62$ ; 24 h:  $p=0.58$ ; 48 h:  $p=0.61$ ) which contradict the present study findings.

#### Conclusion :

From the findings of the present study it is concluded that cold needle injection technique is more effective in reducing the level of pain and discomfort during intramuscular injection than routine injection technique. Cold needle injection technique has no side effect and requires no advance training. It should be considered as a simple, inexpensive, available tool in helping minimize the intramuscular injection pain.

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