# A study to evaluate effectiveness of cold application on pain reduction during administration of intramuscular injection among patients in selected hospital at Mumbai

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*"There are wounds that never show on the body that are deeper and more hurtful than anything that bleeds.*

**Laurell K. Hamilton, Mistral's Kiss**

Pain has been identified as the fifth vital sign by Australian and New Zealand College of Anesthetists. Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage or described in terms of such damage.

Individuals get hospitalized for a wide range of acute illness and injuries. Intramuscular injection is common but painful experience for many people. Although it is considered a basic technique, it is far from innocuous.

Nurses work in almost all settings and are often associated with people who are suffering from pain. They spend a lot of time with patients who are suffering with pain. The application of cold therapy may reduce the intensity of pain level.

There are a number of pharmacological and non-pharmacological measures to reduce pain. Now the non-pharmacological interventions are gaining popularity. Among those non-pharmacological measures, application of cold reduces the ability of pain fibers to transmit pain impulses and studies have shown that cold therapy has the ability to reduce the pain associated with various types of injection.

## Objectives

- To assess the level of pain among the experimental group.
- To assess the level of pain among the control group.
- To evaluate the effectiveness of cold application in pain management during intramuscular injection.
- To find association between the level of pain among patients in experimental group with selected demographic variables.

## Hypothesis

The following hypothesis was tested at 0.05 level of significance:

$H_o$-There will be no difference in the pain perception of the patients receiving intramuscular injection with or without cold application.

$H_1$- There will be significant reduction in the intensity of pain among patients who receive cold application prior to the administration of intramuscular injection.

$H_2$ - There will be significant association between the pain score among the patients in experiment group with selected demographic variables.

## Research methodology

**Research approach:** Research approach was true experimental nature.

**Setting of the study:** The study was conducted in K.J Somaiya Hospital at Mumbai.

**Sampling procedure:** Convenience sampling technique was used.

**Sample size:** The sample for the study was 30 patients who were intended to get intramuscular injection, where 15 patients were considered as experimental group and patients were in control group.

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**Description of the tools:** The tool had 2 sections.

**Section 1:** Demographic data which had details about name, gender, previous experiences, type of injection etc.

**Section 2:** Modified Abbey's pain scale.

**Data collection:** The actual data was collected from 17th December 2015 to 21st December 2015.

# Result and discussion

Descriptive and inferential statistics were used to analyze the data represented in the form of tables and diagrams. The data are presented under the following heading:

**Section I:** Description of the baseline characteristics.

**Section II:** Description of pain score among experimental and control group.

**Section III:** Effectiveness of cold application in reduction of pain during intramuscular injection.

**Section IV:** Association between the levels of pain with selected demographic variables.

## Section I: Description of baseline characteristics

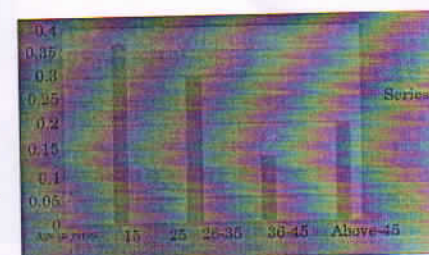This section deals with the baseline characteristics of patients in terms of frequency and percentage.

## Age



**Figure 3:** Bar diagram showing the distribution of patients according to age.

Majority of the patients (36.66% were in the age group of 15 – 2 years, 30% were in the age grou of 26 - 35 years, only 13.33% of th patients were in the age group of 3 -45 years and 20% of the patient were in the age group of above 45.
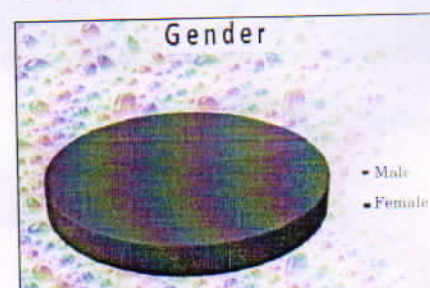
## Gender



**Figure 4 :** Pie diagram showing the distribution of patients according to the gender.

Majority of the patients (20%) wer male and rest (80%) of the patients were female. The data is als shown in the form of pie diagram i Figure 4.
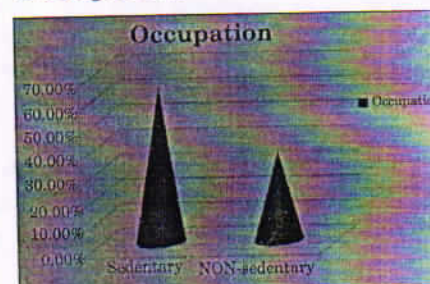
## Occupation



**Figure 5:** Pie diagram showing the distribution of patients according to their occupation.

Majority of the patients (63.33%

| S. No | Variable | Frequency | Percentage |
|---|---|---|---|
| A | **Age in years** | | |
| | 15 -25 | 11 | 36.66 |
| | 26 – 35 | 9 | 30 |
| | 36 – 45 | 4 | 13.33 |
| | 45 and above | 6 | 20 |
| B | **Gender** | | |
| | Male | 6 | 20 |
| | Female | 24 | 80 |
| C | **Occupation** | | |
| | Sedentary | 19 | 63.33 |
| | Non-sedentary | 11 | 36.66 |
| D | **Previous experience** | | |
| | Yes | 29 | 96.66 |
| | No | 1 | 3.33 |
| E | **Type of injection** | | |
| | Clear | 15 | 50 |
| | Oily suspension | - | - |
| | Cloudy | 15 | 50 |
| F | **Quantity of injection (in ml)** | | |
| | 0 - 1 | 22 | 73.33 |
| | 2 – 3 | 8 | 26.66 |
| G | **Site of administration** | | |
| | Deltoid | - | - |
| | Gluteal | 30 | 100 |
| | Vastas lateralis | - | - |

**Table 1: Frequency and percentage distribution of patients according to baseline characteristics**

were sedentary and rest 36.66% of the patients were non sedentary. The data is also shown in the form of bar diagram in Figure 5.
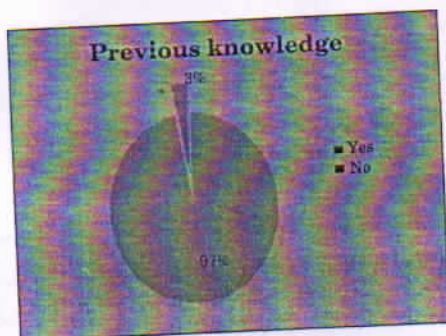
## Previous knowledge



Figure 6: Pie diagram showing the distribution of patients according to their previous knowledge.

Maximum numbers of patients (97%) were yes and (3%) were no.
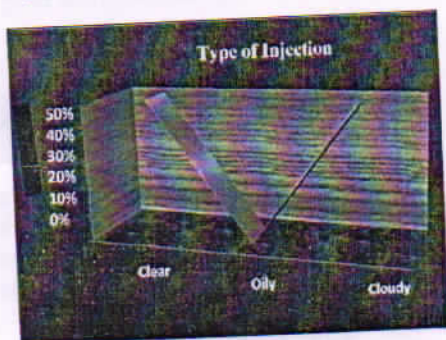
## Type of injection



Figure 7: Pie diagram showing the distribution of patients according to type of injections.

Figure shows that the majority of injections were of clear (50%) and cloudy (50%) type and there were no oily type of injections.

**Table 2:- Mean median and standard deviation of pain score in and control group**

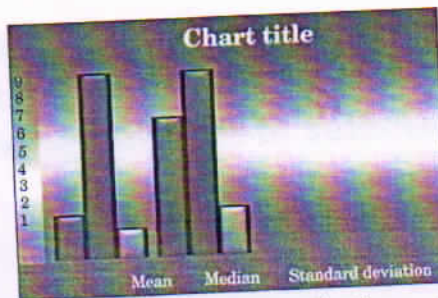| Group | Mean | Median | Standard deviation |
|---|---|---|---|
| Experimental group | 1.86 | 8 | 1.195 |
| Control group | 6 | 8 | 1.029 |



Table 2: Figure shows effectiveness of cold application related to reduction of pain during intramuscular injection.

## Section II: Description of overall pre-test and post-test distribution of the subject according to pain scale

This section deals with the analysis and interpretation of the data to assess the level of pain among the patients in experimental group and control group. A modified Abbey's pain scale was used to collect the data.

The score obtained by the patients who all were receiving IM injections and where arbitrarily categorized into 4 levels as given below.

| | | |
|---|---|---|
| Mild | : | 1 - 4 |
| Moderate | : | 5 - 8 |
| Severe | : | 9 - 12 |
| Very severe | : | 13 - 15 |

The pain score of the patients ranged from 1 – 15 with mean (1.86%). Among the patients, 80% had moderation pain, whereas 60% of the patients had mild pain and 20% of patients had severe level of pain.

## Section III: Effectiveness of cold application in reduction of pain during IM injection

H1:- There will be significant reduction in the intensity of pain caused by intramuscular injection among the patients who received cold application.

The t value is = 10.17 and df = 28

The table value for t at 5% level w 28 DF = 1.701

The calculated value of t is m than the tabled value, so the n hypothesis is rejected, i.e. H1 pothesis is accepted.

## Section IV: Association tween the levels of pa with selected demograpl variables

To find the association between p and selected demographic varial like age, sex, occupation, and vious experience, type of inject quantity of injections, site of it tions, and the following research pothesis was formulated.

**Table 4: Chi-square test showing the association between pain score with selected demographic variables**

n :

| Demographic variables | $x^2$ value | Df | Significar |
|---|---|---|---|
| Age | 3.164 | 1.833 | S |
| Gender | 3.02 | 7.81 | N S |
| Occupation | 1 | 7.81 | NS |
| Previous experience | 1.222 | 7.81 | NS |
| Type of injections | 4.285 | 12 | N S |
| Quantity of injections | 0.264 | 7.81 | NS |
| Site of administration | 0.534 | 10.32 | NS |

S = Significant; NS = Not significant

The data presented in Table 4 sl the association between pain sco the patients with selected demog ic variables. There was no signif association between pain scores selected demographic variables sex, occupation, previous experi type of injection, site of admin tion and quantity of injection found not significant at 0.05 leve.

## Conclusion

The study was conducted to as:

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