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RESEARCH ARTICLE

A STUDY TO ASSESS THE EFFECTIVENESS OF COLD COMPRESSION ON PAIN AND ECCHYMOSIS ON PATIENTS GETTING SUBCUTANEOUS LOW MOLECULAR WEIGHT HEPARIN IN A SELECTED TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Due to the advancement in preventive treatment modalities, the number of patients receiving LMWH is on rise. Low-molecular-weight heparin (LMWH) a class of anticoagulant, is used in the prevention and treatment of venous thromboembolism (deep vein thrombosis and pulmonary embolism) and various cardiovascular conditions and for prophylaxis and treatment of DVT in surgeries in pre and post op phase .One of the most commonly encountered adverse physiological responses to this intervention is pain and the formation of ecchymosis at the injection site. This creates a challenge for the nurses administering the LMWH to minimize ecchymosis and or patient discomfort during the treatment regimen.
Aim: To assess the effectiveness of cold compress on pain and ecchymosis in patients getting subcutaneous LMWH.
Methodology: In present study, the researcher selected a single group pre and post intervention (quasi experimental design, n=35). Keeping in view the objectives of the study, the investigator assessed the level of pain and ecchymo sis of patients getting subcutaneous heparin prior to cold compression; followed by assessing the level of pain and ecchymosis on administration of subcutaneous heparin after cold compression. In this study cold compression refers to use of readymade ice packs which were used on patients left arm for a period of 3 min before administering subcutaneous LMWH.
Results : Out of 35 samples, without cold compression, majority 62.85%(22) of sample recorded their pain scale in moderate range 4-6 of pain scale , mild range 34.28%(12), severe range 2.8% (1).With intervention (cold compress for 3 mins at the site prior to administration) majority 65.7%(23) sample experienced mild range, moderate range 31.42%(11), severe range 2.85%(1). It implies that there was significant reduction in pain level of the subjects after administration of cold compress which makes it evident that application of cold compress is effective in reducing the pain. Out of the same 35 samples , subcutaneous LMWH was administered without cold compression and ecchymosis scale of grade 0 were 68.57%(24), grade 1 were 25.71%(9), grade 2 were 5.71%(2). With cold compression ecchymosis scale recorded of grade 0 were 91.42% (32) , grade 1 were 8.57%(3), grade2 and grade 3 shows 0%. It implies that there was significant reduction in ecchymosis level after cold compress which makes it evident that cold compression was effective in reducing the ecchymosis.
Conclusion: Majority of patient had a decreased perception of pain and showed decreased evidence of ecchymosis [65.7%(23) & 68.57%(24) respectively], by the technique of cold compress application before administration of the injection. Therefore it can be concluded on the basis of this study that ice cold application was effective in reducing pain and ecchymosis and enhancing the comfort of patient.

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INTRODUCTION

Earliest of medical traditions include those of Babylon, China, Egypt and India. The Hippocratic oath is still taken (although significantly changed from the original) by doctors up to today, was written in Greece in the 5th century BC. In the medieval age, surgical practices inherited from the ancient masters were improved and then systematized in Rogueries: The Practice of Surgery. Universities began systematic training of physicians around the years 1220 in Italy. During the Renaissance, understanding of anatomy improved and the microscope was invented. The germ theory of disease in the 19th century led to cures for many infectious diseases.

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The Greeks went even further, introducing the concepts of medical diagnosis, prognosis, and advanced medical ethics. Advanced research centres opened in the early 20th century, often connected with major hospitals. The mid-20th century was characterized by new biological treatments, such as antibiotics. These advancements, along with developments in chemistry, genetics, and lab technology (such as the x-ray) led to modern medicine. Medicine was heavily professionalized in the 20th century, and new careers opened to women as nurses (from the 1870s) and as physicians (especially after 1970). The 21st century is characterized by highly advanced research involving numerous fields of science. An injection (often referred to as a "shot" in US English, or a "jab" in UK English) is an infusion method of putting fluid into the body, usually with a syringe and a hollow needle which is pierced through the skin to a sufficient depth for the material to be administered into the body was introduced into the medical arena. An injection follows a parenteral route of administration; that is, administration via a route other than through the digestive tract. Since the process inherently involves a small puncture wound to the body (with varying degrees of pain depending on injection type and location, medication type, needle gauge and the skill of the individual administering the injection), there exists a common phobia – "Trypanophobia"- fear of needles.

There are several methods of injection or infusion used in humans including intradermal, subcutaneous, intramuscular, intravenous, intraosseous, intraperitoneal, intrathecal, epidural, intracardiac, intraarticular, intracavernous and intravitreal. Rodents used for research are often administered intracerebral, intracerebroventricular or intraportal injections as well. Long-acting forms of subcutaneous/intramuscular injections are available for various drugs, and are called depot injections. Injections are among the most common health care procedures, with at least 16 billion administered in developing and transitional countries each year. 95% of injections are administered in curative care, 3% are for immunization, and the rest for other purposes, such as blood transfusions. In some instances the term *injection* is used synonymously with inoculation even by different workers in the same hospital. This should not cause confusion; the focus is on what is being injected/inoculated, not the terminology of the procedure. Due to the advancement in treatment modalities, the number of patients receiving LMWH is on a significant rise. It is a class of anticoagulant used in the prevention and treatment of venous thromboembolism (deep vein thrombosis and pulmonary embolism) and various cardiovascular conditions and for prophylaxis and treatment of DVT in surgeries in pre and post op phase. Injection procedure creates a phobia starting from a neonate to the elderly. The main reason for this phobia is pain.

The subcutaneous administration of the anticoagulant LMWH is a frequently performed nursing intervention and often causes problem such as bruise, pain and hematoma at the site of injection. Bruise (bluish discoloration) occurs after sometime but not very definite. This has implications in nursing as not only the patient experiences the physical discomfort and the psychological impact of visible body trauma, but bruising and indurations limit the possible sites for injections and may lead to anxiety, disturbance of body image, rejection of treatment in patients and reduced reliant behavior. Ecchymosis resulting from LMWH reaches its peak at 48 hrs. and begins to resolve within 24 hrs. of injection.

In order to comply with treatment modality, pain reduction and thereby physical and psychological comfort to the patients is considered the most. It is incumbent upon health care professionals to be knowledgeable and sensitive towards adverse outcomes resulting from LMWH therapy and promote safety and comfort to patients. To put this into practice, we have selected a cost effective, easily available, non-invasive and non-pharmacological intervention (ice packs) for control of pain and ecchymosis in patients receiving LMWH prior to giving injection.

MATERIALS AND METHODS

In present study, the researchers selected the single group pre and post intervention (quasi experimental design). Keeping in view the objectives of the study, the investigator assessed the level of pain and ecchymosis on patients getting subcutaneous heparin prior to cold compression; followed by assessing the level of pain and ecchymosis on administration of subcutaneous heparin after cold compression in the same patients. By using purposive sampling 35 patients admitted in the tertiary hospital were selected. The independent variables in the study were cold compression. The dependent variables in this study were level of pain and ecchymosis. Pain was measured by the standardized Numerical Pain Rating Scale (NPRS) and ecchymosis was measured by the Ecchymosis Measuring Tool (EMT) developed by the researchers which was approved by the head of departments of Medicine and Surgery. The validity and reliability of the tool was ascertained and was found satisfactory during the pilot study. The content validity and reliability of the tool was done, which suggested that the tool was reliable. The pilot study was done on 5 samples and the feasibility of the study was established.

Consent of the patient was procured prior and the confidentiality regarding the details of the sample was maintained. Ehtical clearance was given by the hospital ethical committee of the concerned setting. The study was conducted in medical surgical wards of tertiary care hospital The target population of the present study was the patients admitted in medical surgical wards of selected tertiary care hospital. The present study comprised of a total of 35 patients selected as per the inclusion criteria. The sampling technique used in this study was non probability purposive method of sampling. This entails the use of the samples purposefully in the study, until the desired sample is reached. Everyday list of the patients who were admitted in the medical surgical wards were checked and all patients who met the criteria were selected. The LMWH injection was given to the prescribed patient subcutaneously twice in a day, morning dose after the cold compress for three minutes on the right arm and the evening dose without the cold compression on the left arm. Pain was measured using the NPRS scale and ecchymosis was measured after 48 hrs using the EMT for all subjects.

RESULTS

Based on the objectives and hypothesis the collected data was analyzed by using descriptive and inferential statistics. Results showed that that majority [62.85%] of the sample experienced moderate pain without intervention and severe pain was experienced by [2.85%] as shown in table 1. It was seen that majority 65.71% of the sample with intervention experienced mild pain while only 2.85% of sample experienced severe pain

Table 1. Frequency & % of patients with varying severity of pain without intervention

N=35

Severity Of Pain	Frequency Of Patients Before Intervention	Percentage
Mild	12	34.28%
Moderate	22	62.85%
Severe	01	2.85%

after administration of the cold compress prior to the subcutaneous injection of LMWH (Table 2).

Table 2. Frequency & % of patients with varying severity of pain after intervention

Severity Of Pain	Pain Of Patients After Intervention	Percentage
Mild	23	65.71%
Moderate	11	31.42%
Severe	1	2.85%

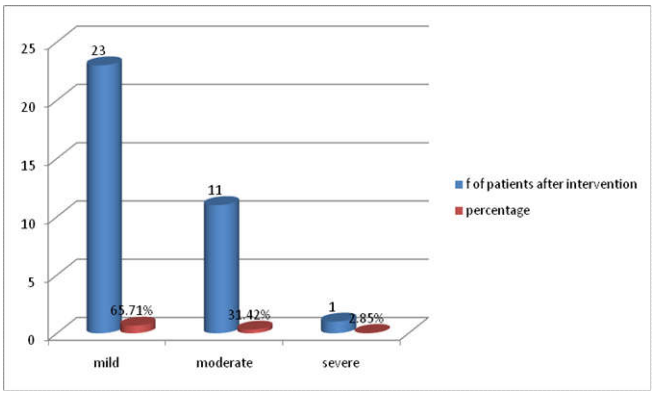

Figure 2. Percentage of patients with varying severity of pain after intervention

Whereas without intervention 62.85% of patients experienced moderate level of pain (Table 1). While comparing the ecchymosis among subjects with or without cold compression prior to injection LMWH, results showed that 68.57% of the samples had no ecchymosis without intervention and the percentage increased to 91.42% with the intervention shown in Tables 3 & 4 and illustrated in Figures 3 & 4 respectively.

Table 3. Frequency & % of patients with varying grades of ecchymosis without intervention

N=35

Grades Of Ecchymosis Before Intervention	No. of Patients	Percentage
0	24	68.57%
1	9	25.71%
2	2	5.71%
3	0	0%

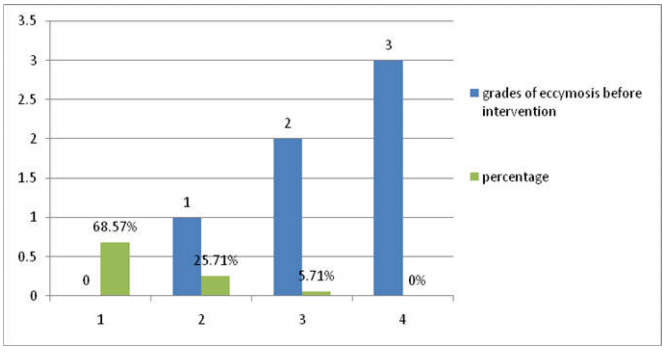

Figure No. 3. Percentage of patients with varying grades of ecchymosis without intervention

Table No. 4. Frequency & % of patients with varying grades of ecchymosis after intervention

N=35

Grades Of Ecchymosis After Intervention	No. Of Patients	Percentage
0	32	91.42%
1	3	8.57%
2	0	0%
3	0	0%

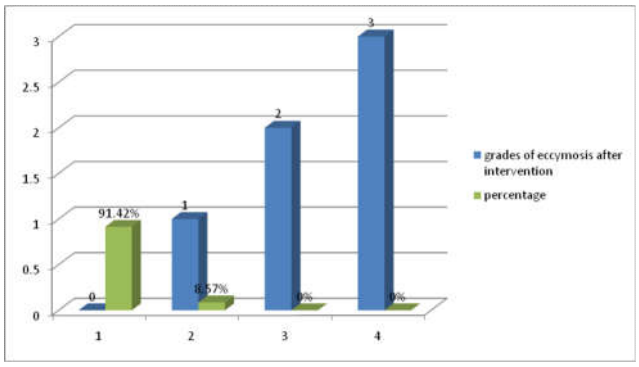

Figure No. 4 :% of patients with varying grades of ecchymosis after intervention

Description of association between level of pain and ecchymosis among subjects with or without cold compression prior to injection LMWH with selected demographic variables like age and gender shows thatt without intervention, majority of the samples experienced moderate pain, especially in the age group 61-80 i.e.37.14% and also severe pain was experienced by only this age-group people i.e. 2.85 %.(Figure 5).It was also evident that after intervention, there was no significant change except that in the age group of 61-80, one of the sample experienced mild pain compared to that of moderate pain before intervention (Figure 6).

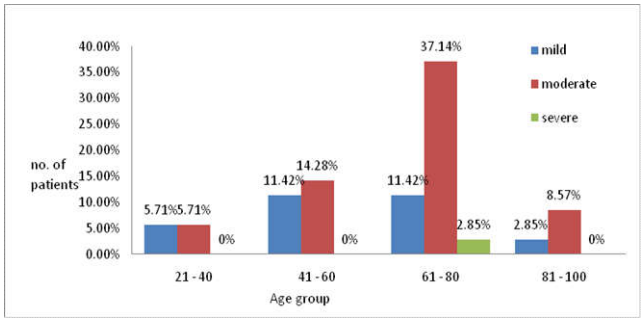

Figure 5. Comparison of pain without intervention with age group

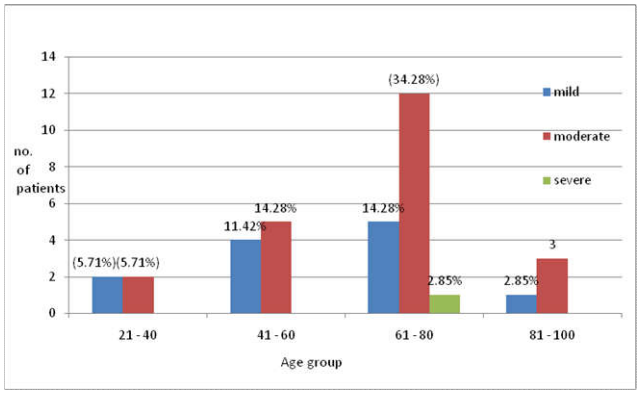

Figure 6. Comparison of pain after intervention with the age group

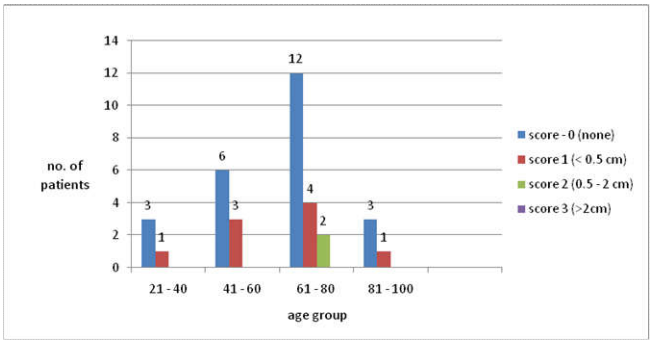

Figure 7. Extent of ecchymosis without intervention in varying age-group of patients

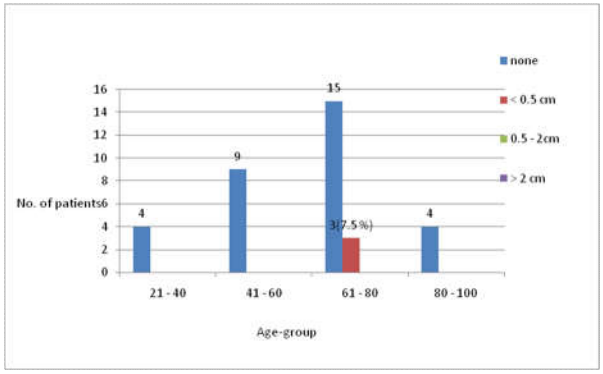

Figure 8. Comparison of ecchymosis with intervention with age group

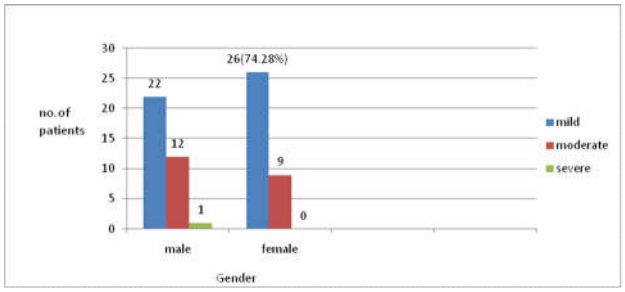

Figure 9. Pain without intervention Vs gender

Figure 7 & 8 shows that before intervention minority had ecchymosis with score 2(0.5-2 cm) i.e 5.71% (2) between the age group of 61-80 where as after intervention majority had no ecchymosis and only 3(7.5%) had grade 1 ecchymosis. Hence, it is seen that majority of the subjects in all the age groups were relieved of ecchymosis with intervention compared to without intervention.

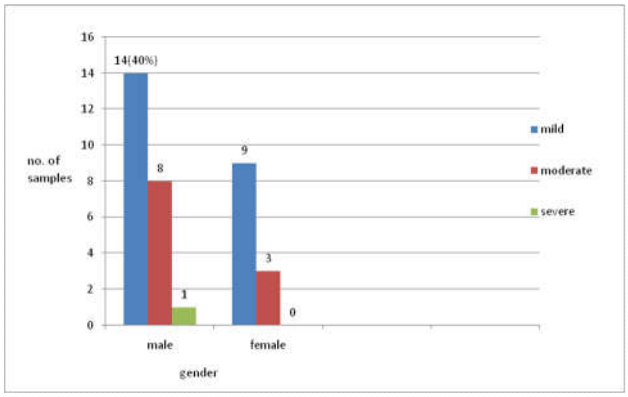

Figure 10. Pain after intervention Vs gender

It can be inferred from figures 9 & 10 that after intervention, the no. of females experiencing pain (mild) reduced to 40% (14). When compared to that of before intervention wherein majority of the females i.e.74.28 % (26) experienced pain (mild).

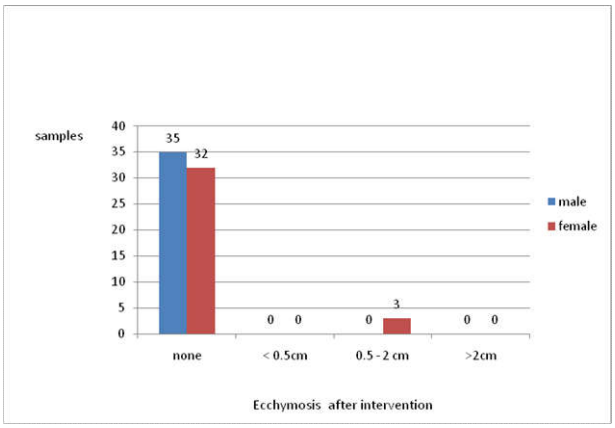

Figure 11. Ecchymosis after intervention vs gender

Same results were shown for ecchymosis wherein the extent of ecchymosis was reduced significantly in females post intervention (Figure11).

DISCUSSION

The purpose of the study was to assess and evaluate the level of pain perception and ecchymosis among patients with and without application of cold compress prior to injection of LMWH. The results show that the application of the simple cold compress prior to the administration of LMWH can significantly reduce the pain and ecchymosis associated with the injection. In order to comply with treatment modality, pain reduction and thereby physical and psychological comfort to the patients is considered the most important factor. It is incumbent upon health care professionals to be knowledgeable and sensitive towards adverse outcomes result from LMWH therapy and promote safety and comfort to patients and to relieve physical discomfort and physiological impact of visible body trauma.

Conclusion

Pain is a distressing feeling often caused by intense or damaging stimuli, such as stabbing a toe, burning a finger, putting alcohol on a cut. Because it is a complex, subjective phenomenon, defining pain has been a challenge. More than the subjective pain the visual impact is more traumatic to the patients. To promote safety and comfort to patients is of utmost importance and it is the right of a patient to demand both. In the present scenario of medicine, treatment with comfort is encouraged and welcomed the most. Historically, the treatment was only towards cure where Sushruta has performed surgery without anaesthesia aiming towards treating illness. Present scenario states cure with care and do no harm. “Primum non nocere..”…. “first…to do no harm”.

Recommendations

Keeping in view the findings of the findings of the study, the following recommendations are made

- The study can be conducted on a larger sample size to make wider generalization of the study findings.

- Cold compression can be included in the SOPs of the hospitals as there is no evidence of any negative effects or complications of cold compress. However it does give a significant amount of comfort to the patients as depicted in this small scale study.

Conflict of interest: All authors have none to declare.

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