

A Comparative Study of Arm versus Abdomen Injection Sites on Bruising and Pain among Patients Receiving Low Molecular Weight Heparin Injection

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ABSTRACT

The present study was conducted to compare arm versus abdomen injection sites on bruising and pain among samples received LMWH injection. The study made use of quantitative approach with randomized controlled trial (RCTs). The study was conducted in the cardiology wards and CICU of Caritas Heart Institute, Kottayam. The population included in the study was patients who receive Low Molecular Weight Heparin injection in upper arm and abdomen. Purposive sampling technique was used to select 60 samples for the study. The tools used were structured questionnaire on socio-demographic and clinical data, linear measurement of bruising by calibrated ruler and pain assessed by numerical pain rating scale. Based on the findings of the study, the following conclusions were drawn. The obtained mean scores of occurrences of bruising among patients who receive LMWH injection in upper arm is 3.43 and in patients who receive LMWH injection in abdomen is 11.0. Hence it is depicted that occurrence of bruising among patients who receive LMWH injection in abdomen is large (above 5mm²) and bruising level among patients who receive LMWH injection in upper arm is very less. The results revealed that, there is significant difference ($t=4.893$, $P=0.000$) in the occurrence of bruising among patients who receive LMWH injection in x upper arm and abdomen after 72 hrs. The mean scores of level of bruising of patients who receive LMWH injection in abdomen are higher than that of patients who receive LMWH injection in upper arm. The study concluded that level of bruising among patients who receive LMWH injection in abdomen is very large. Hence, upper arm is more preferable site for LMWH injection.

INTRODUCTION

Coronary artery disease (CAD) is the most common type of heart disease, killing 365914 people in 2017. About 18.2 million adult age 20 and older have a CAD (about 6.7%). About 2 in 10 deaths from CAD happen in adults less than 65 years. As of 2018, 30.3 million US adult were diagnosed with heart disease. Every year about 647000 Americans die from heart disease. It is the leading cause of death in the United States in both men and women¹.

Low Molecular Weight Heparin is the drug of choice for CAD. It is used widely to reduce patient's risk of harmful clot formation. It has several potential advantages; reliable anticoagulant effect, lower the incidence of heparin induced thrombocytopenia and a

simple subcutaneous administration that permit short term and long term treatment². The medication is injected into fat and connective tissue underlying the dermis where there is less blood flow and as a result slower medication absorption³. The umbilical region of the abdomen, lateral arm and thighs are considered appropriate sites for subcutaneous injection. Subcutaneous administration of LMWH may result in complications such as pain and bruising at injection site.

Objectives of the study

1. Assess the occurrence of bruising and level of pain among patients receiving LMWH injection on upper arm

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KEYWORDS: Low Molecular Weight Heparin, Randomized Controlled Trials

2. Assess the occurrence of bruising and level of pain among patients receiving LMWH injection on abdomen.
3. Comparison of occurrence of bruising among patients receiving LMWH injection on upper arm and abdomen.
4. Comparison of level of pain among patients receiving LMWH injection on upper arm and abdomen.
5. Find the association between occurrence of bruising and level of pain of LMWH injection sites on upper arm and abdomen with demographic and clinical variables.

Materials and methods

Present study was conducted in the cardiology wards and CICU of Caritas Heart Institute, Kottayam., Kerala. Quantitative approach with randomized controlled trial (RCTs) used. The population included in the study was patients who receive Low Molecular Weight Heparin injection in upper arm and abdomen. Purposive sampling and random assignment technique was used to select 60 samples for the study on the basis of inclusion and exclusion criteria. The tools used were structured questionnaire on socio-demographic and clinical data, linear measurement of bruising by calibrated ruler and pain assessed by numerical pain rating scale.

Researcher injects the prefilled enoxaparin for 60 samples and assess pain and bruising in all. In the first group, subcutaneous injection will be administering in the lateral abdomen about 5 cm from the umbilicus. And the second group will receive the enoxaparin subcutaneously in to the upper arm. Injection technique is the same for both sites. First, injection sites disinfected with alcohol wipes outwardly and left to dry. The needle insert at a 90° for the abdomen and 45°-90° for upper arm, depending on the presence of subcutaneous fat. After injection, the needle will be removed smoothly and the site will be pressed slightly with cotton wool. Inform the patients not to rub or massage injection sites which is circled and labeled with water proof marker. The circled area has an average diameter of 5 cm.

The pain will be assessed by researcher rating the intensity of pain on a scale of 0 (no pain) to 10 (worst pain). Bruising will be measured by tracing the outline of bruise on to a transparency using OHP marker and measuring area using calibrated ruler after 72 hrs.

The selected socio demographic and clinical variables were analyzed using frequency and percentage. The

comparison of arm versus abdomen injection sites of LMWH will be analyzed by using independent t test. The association between LMWH injection sites of arm and abdomen in pain and bruising will be analyzed using chi-square test. The data were analyzed by using licensed SPSS 26 version.

Results

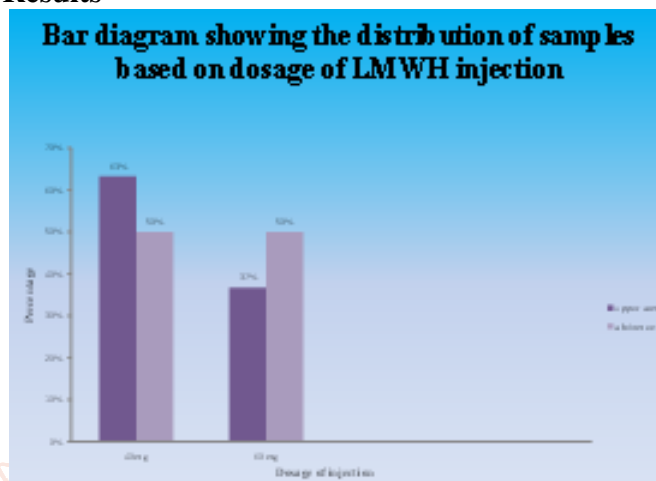


Figure 1: Distribution of samples based on dosage of LMWH injection

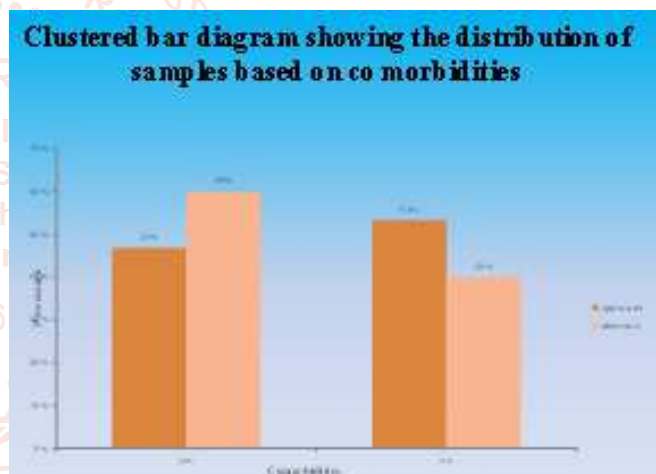


Figure 2: Distribution of samples based on co-morbidities

Distribution of samples based on level of bruising

30% of samples who received LMWH injection in upper arm and majority (73.3%) in samples who received LMWH injection in abdomen had large bruising and samples who received injection in upper arm had small (33%) bruising after 72hours whereas in samples who received LMWH injection in upper arm (53.3%) had no bruising after 72hrs.

Frequency and percentage distribution of samples by the occurrence of bruising after 72 hrs (n=60)

	Upper arm (n ₁ =30)		Abdomen (n ₂ =30)	
	f	%	f	%
No bruise	16	53.3	4	13.3
Small	5	16.7	4	13.4
Large	9	30	22	73.3

The data in table 1 shows that at 72hrs majority in samples who received LMWH injection in upper arm (30%) and abdomen (73.3%) had large bruising whereas in more than half of the samples(53.3%) who received LMWH injection in upper arm and samples (13.3%) who received LMWH injection in abdomen had no bruising.

Distribution of samples based on level of pain

Pain was measured using numerical pain rating scale and assessed immediately after the injection. Majority of samples (80%) who received LMWH injection in upper arm and samples who received LMWH injection in abdomen (60%) had mild pain whereas in (6.7%) of samples who received LMWH injection in upper arm and 20% of samples who received LMWH injection in abdomen had moderate pain.

Frequency and percentage distribution of samples by the their level of pain

(n=60)

	Upper arm		Abdomen	
	(n ₁ =30)		(n ₂ =30)	
	f	%	f	%
No pain	2	6.7	6	20
Mild pain	24	80	18	60
Moderate pain	4	13.3	6	20

The data in table 2 shows that majority (80%) of samples who received LMWH injection in upper arm had mild pain and 6.7% of samples had no pain, whereas samples who received LMWH injection in abdomen 60% had mild pain and 20% had no pain.

Comparison of injection sites based on occurrence of bruising and intensity of pain.

Independent ‘t’ test was used to compare mean scores regarding the occurrence of bruising in samples who received injection in upper arm and abdomen is 3.43 and 11.10 respectively. The ‘t’ value (t= 4.893, P= 0.000) indicated that there is significant difference between the occurrence of bruising among patients who received injection in upper arm and abdomen. Level of bruising is more among samples who received injection in abdomen after 72hrs.

The intensity of pain in samples who received injection in upper arm and abdomen were 2.33 and 2.40 respectively. The ‘t’ value (t= .226, P= .186) indicated that there is no significant difference between the intensity of pain among samples who received injection in upper arm and abdomen. So the null hypothesis is accepted which indicates there is no significant difference between intensity of pain among samples who received injection in upper arm and abdomen.

Mean, standard deviation and t test value of occurrence of bruising among samples receiving LMWH injection on upper arm and abdomen (n=60)

	Mean	SD	t value	P value
Bruise score				
Upper arm	3.43	2.725	4.893**	0.000
Abdomen	11.10	8.138		

**Significance at P<0.001

Limitations

- Study was limited to small representative group of patients receiving LMWH injection in selected setting by purposive sampling technique which restrict the generalizability.
- Bruise assessed only once due to time constraints.
- Pain perception different in each individual
- Use of analgesics

Recommendations

Follow up study can be taken up to determine the appropriateness of the selection of upper arm on the occurrence of bruising and level of pain among a large sample of patients with receiving LMWH injection.

Conclusion

The present study was aimed to compare occurrence of bruising and level of pain among patients who receive LMWH injection in upper arm and abdomen in a selected hospital Kottayam. Based on the findings of the study, the following conclusions were drawn.

This obtained mean scores of occurrence of bruising among patients who receive LMWH injection in upper arm is 3.43 and in patients who receive LMWH injection in abdomen is 11.0. Hence it is depicted that level of bruising among patients who receive LMWH injection in abdomen is large (above 5mm²) and bruising level among patients who receive LMWH injection in upper arm is very less.

The present study results revealed that, there is significant difference (t= 4.893, P= 0.000) in the level of bruising among patients who receive LMWH injection in upper arm and abdomen after 72 hrs. The mean scores of level of bruising of patients who receive LMWH injection in abdomen are higher than that of patients who receive LMWH injection in upper arm.

The study concluded that level of bruising among patients who receive LMWH injection in abdomen is very large. Hence, upper arm is more preferable site for LMWH injection.

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