A STUDY TO ASSESS THE EFFECT OF SLOW VS FAST SUBCUTANEOUS LOW MOLECULAR WEIGHT HEPARIN (LMWH) ON EXTENT OF BRUISING AND SITE PAIN INTENSITY AMONG PATIENTS RECEIVING LMWH ADMITTED IN SELECTED ICUS OF A TERTIARY CARE HOSPITAL, LUDHIANA, PUNJAB

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ABSTRACT

Background: Safe administration of subcutaneous injection is the major role of nurses to reduce complications such as bruising, pain and hematoma at injection site which requires better nursing skill. As a modified technique of administering slow LMWH injection may reduce these complications.

Materials and methods: The present randomized control trial consisted of 90 subjects admitted to selected ICUs of DMCH, Ludhiana (Punjab) selected by convenience sampling were treated with subcutaneous LMWH injection. The total 180 injection sites of abdomen (Left & Right side around umbilicus) were randomly assigned by lottery method into experimental arm site (injection given in within 30 sec.) and control arm site (injection given within 10 sec.). VAS and NPR scale were used to assess the site pain intensity and circle master ruler to measure extent of bruising at 0 hour, 12 h, 24 h and 48 h in both arm sites.

Results: Out of 90 subjects mean age was 51.94 ± 19.49). The mean difference in site pain intensity at 0 hour as per VAS and NPR was significant ($p=0.00$) in both arm sites. Additionally, there was a significant difference on extent of bruising at 12 h, 24 h and 48 h in both arm sites ($p=0.00$).

Conclusion: According to results, slow injection was more effective in reducing site pain and bruise than fast LMWH injection.

Key words: LMWH injection, VAS, NPR scale, site pain intensity, extent of bruising

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INTRODUCTION

Low Molecular Weight Heparin (LMWH) i.e. Inj. Dalteparin or Enoxaparin are anticoagulants with the prefilled syringe of 2500 - 12,500 IU administered subcutaneous for the treatment of thromboembolic disorders, which results in local reactions such as bruising and site pain intensity at the injection site. Currently in many hospitals rapid or fast LMWH subcutaneous injection is usually administered by nurses to patients that result in site pain caused by mechanical trauma with needle puncture leads to damage or injury of nerve endings and fragility of blood vessels that may cause discoloration of skin. According to Ahmadi M, et al (2016) there was a significant association found in between the time duration of the injection and the size of the bruising after 48 and 72 h of injection at ($p = 0.05$), Geng W, Zhang Y, Shi J (2018) revealed that incidence of subcutaneous haemorrhage in research group in 30 sec. (46.9%) was significantly lower in control group in 10 sec. (83.1%) at ($p < 0.05$). Visvanathan et al. (2015) shows that slow s/c administration of heparin results in lower pain intensity and small bruises size at the injection site. Being a nurse, its primary role to

administer the medications in a correct way to the patients receiving LMWH with less pain intensity and bruising. So, the present study was planned to assess whether the slow vs fast LMWH would be able to reduce the chances of bruising and site pain intensity at injection site or not subsequently.

MATERIAL AND METHODS

Study Design: Randomized Control Trial (split body design), single blinded, active treatment-concurrent control trial was employed in the study to assess the effect of slow vs. fast subcutaneous (LMWH) on extent of bruising and site pain intensity among patients receiving LMWH admitted in selected ICUs of a tertiary care hospital, Ludhiana, Punjab. The intervention was administered in randomly allocated site of abdomen (around umbilicus) and control on the alternate side.

Sample size: 90 subjects (180 injection sites).

Sample size calculation: Sample size calculation was done for estimated 26.4% difference in control arm and interventional arm with α of 0.05 and power at 80%, two-sided significance level of 95%.

Study Duration: November 2019 to July 2020

DATA ANALYSIS

Section I: Socio bio demographic variables.

Table 1: Percentage distribution of subjects as per socio bio demographic characteristics

N=90

Socio bio demographic variables	f (%)
Age (in years) *	
< 20	4(4.4)
20-40	24(26.7)
40-60	30(33.3)
> 60	32(35.6)
Gender	
Male	59(65.6)
Female	31(34.4)
Marital status	
Married	77(85.6)
Unmarried	12(13.3)
Widow/widower	1(1.1)
Religion	
Sikh	49(54.4)
Hindu	36(40.0)
Christian	5(5.6)
Habitat	
Rural	60(66.7)
Urban	30(33.3)
Educational Status	
Illiterate	24(26.7)
Primary	11(12.2)
Secondary	26(28.9)
Higher Secondary	16(17.8)
Graduate & above	13(14.4)
Working Status	
Working	38(42.2)
Not-working	52(57.8)
Dietary Profile	
Vegetarian	43(47.8)
Non-Vegetarian	47(52.2)
Socioeconomic Status**	
Upper (I)	4(4.4)
Upper middle (II)	17(18.9)
Lower middle (III)	44(48.9)
Upper lower (IV)	22(24.4)
Lower class (V)	3(3.3)

Table: 1 depicts socio bio demographic characteristics of subjects, out of total 90 subjects (**mean age** of subjects was 51.94 $\pm$ 19.49), most of the subjects were male

i.e. 59 (65.60%), married, belonged to Sikh religion, living in rural area, having qualification up to secondary level, non-working belonging to lower middle-class socioeconomic status

N=90

Table 2: Percentage distribution of subjects as per clinical profile

Clinical profile	f (%)
Diagnosis (n=90)	
Neurological	40(44.4)
Renal	12(13.3)
Respiratory	10(11.1)
GI	8(8.9)
Miscellaneous	7(7.8)
Endocrine	6(6.7)
CVS	4(4.4)
Orthopaedics	3(3.3)
Comorbidities (n=13)	
DM type 2	7(53.84)
HTN	3(23.07)
DM type 1	3(23.07)
Drugs received	
Anticoagulants	
Clexane	50(55.6)
Fragmin	40(44.4)
Antiplatelets (n=9)	
Deplatt-A	4(44.4)
Clopidogrel	5(55.6)
Platelet count*(10³/μL)	
<150	19(21.1)
150-250	26(28.9)
250-350	17(18.9)
>350	28(31.1)

Platelet Count Mean $\pm$ SD = 266.49 $\pm$ 123.21*

Table 2 depicts percentage distribution of subjects as per clinical profile here out of total 90 subjects most of them were having Neurological disorders with DM type 2 as comorbidity. Most of the subjects were receiving Inj. Clexane as anticoagulant

therapy and tab. Clopidogrel as antiplatelet therapy.

Section II

Site pain intensity and extent of bruising at injection site.

Table 3: Percentage distribution of site pain intensity among Experimental Arm and Control Arm as per VAS and NPR.

N=90 (180 injection sites)									
Groups	Scale	Post Interventional Assessment of site pain intensity							
		No pain (0)		Mild (1-3)		Moderate (4-6)		Severe (7-10)	
		VA S	NP R	VA S	NP R	V A	NP R	V A	N P
Experimental Arm sites (n ₁ =90) *	0 hr	55(61.1)	51(56.6)	24(26.6)	21(23.3)	10(11.1)	12(13.3)	1(1.1)	6(6.6)
	12 hr	-	-	-	-	-	-	-	-
	24 hr	-	-	-	-	-	-	-	-
	48 hr	-	-	-	-	-	-	-	-
Control Arm sites (n ₂ =90) *	0 hr	38(42.2)	34(37.7)	16(17.7)	12(13.3)	21(23.3)	22(24.4)	15(16.6)	22(24.4)
	12 hr	-	-	-	-	-	-	-	-
	24 hr	-	-	-	-	-	-	-	-
	48 hr	-	-	-	-	-	-	-	-

VAS score = 0-10, NPR score = 0-10

No pain was present in both groups before intervention and at 12 hr, 24 hr, 48 hr

* n₁ & n₂ are total number of sites in experimental arm and control arm.

Table 4: Comparison of site pain intensity among Experimental Arm and Control Arm as per VAS and NPR at 0 hour.

N=90 (180 injection sites)

VAS			NPR			
Site Pain Intensit y	f %		χ^2 statistics	f %		χ^2 statist ics
	Exp Arm (n ₁ =90)	Control Arm (n ₂ =90)		Exp Arm (n ₁ =90)	Control Arm (n ₂ =90)	
No	55	38	1.32 df=3 p=0.00*	51	34	1.45 df=3 p=0.00*
Mild	24	16		21	12	
Moderate	10	21		12	22	
Severe	01	15		06	22	

χ^2 Statistics between VAS & NPR

*Significant

Table 5: Comparison of Mean site pain intensity among Experimental Arm and Control Arm

N = 90 (180 injection sites)

Scale	Group	0 hour				
		M±SD	Mean %	Mean Diff.	t	p
VAS	Exp. Arm (n ₁ =90)	1.06±1.72	1.18	1.08±1.27	8.02	0.00*
	Control Arm (n ₂ =90)	2.14 ± 1.14	2.38			
NPR	Exp. Arm (n ₁ =90)	1.68 ± 2.41	1.87	1.94±2.40	7.68	0.00*
	Control Arm (n ₂ =90)	3.63 ± 3.34	4.03			

Max score of VAS (Exp. Arm) = (1-3) & NPR (Exp. Arm) = (4-6) *significant at p<0.05, df=89

Max score of VAS (Control Arm) = (4-6) & NPR (Control Arm) = (4-10)

None of the observations were recorded in 12hrs, 24 hrs and 48 hrs.

Table 6: Comparison of percentage distribution extent of bruising at injection site in Experimental Arm and Control Arm.

N=90 (180 injection sites)

Variables	Post Interventional assessment on extent of bruising							
	0 hour		12 hours		24 hours		48 hours	
	f (%)		f (%)		f (%)		f (%)	
	E (n ₁ =90)	C(n ₂ =90)	E(n ₁ =90)	C(n ₂ =90)	E(n ₁ =90)	C(n ₂ =90)	E(n ₁ =90)	C(n ₂ =90)
No bruise (0- 2mm)	90(100)	90(100)	86(95.6)	63(70)	86(95.6)	62(68.9)	87(96.7)	62(68.9)
Small bruise (2-5mm)	-	-	4(4.4)	16(17.8)	4(4.4)	15(16.7)	3(3.3)	16(17.8)
Large Bruise (>5mm)	-	-	-	11(12.2)	-	13(14.4)	-	12(13.3)

*No bruising was present in both arm before intervention at injection site, E: Exp. Arm & C: Control Arm

Table 7: Comparison of Mean extent of bruising among Experimental Arm and Control Arm.

N=90 (180 injection sites)

Group	12 hours				24 hours				48 hours			
	M±SD	M %	Mean diff.	p	M±SD	M %	Mean diff.	p	M±SD	M %	Mean diff.	p
Exp. Arm (n ₁ =90)	0.36 ± 0.70	0.40	2.40±5.44	0.00*	0.31±.66	0.35	2.56±5.40	0.00*	0.18 ± 0.54	0.20	2.58±5.41	0.00*
Control Arm (n ₂ =90)	2.70 ± 5.21	3.00			2.88±5.4	3.20			2.76 ± 5.49	3.07		

*significant at $p < 0.05$, t value =4.29, $df=89$

Max. Bruise size in Exp. Arm at 12,24 & 48 hours=(1.5-2mm)

Max. Bruise size in control Arm at 24 & 48 hours=(15-35mm)

Min Bruise size in Exp. Arm at 12 hours=(0-1mm²) & Control Arm =(3-5mm)

Section III

Table 8: Association of site pain intensity with socio bio demographic variables.

N=90 (180 injection sites)

Socio bio demographic variables	n	Pain at 0 Hour			
		VAS		NPR	
		Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)	Exp. Arm (n ₁ =90)	Control Arm(n ₂ =90)
		M±SD	M±SD	M±SD	M±SD
Age (in years)					
< 20	4	1.50±3.0	2.25±1.50	1.00±2.00	3.25±3.20
20-40	24	0.79±1.50	1.95±1.16	1.37±2.51	3.08±3.53
40-60	30	0.86±1.65	1.83±.91	1.53±2.30	3.03±2.84
> 60	32	1.40±1.77	2.56±1.21	2.15±2.51	4.65±3.54
F value		0.83	2.49	0.67	1.58
p value		0.47 ^{NS}	0.06 ^{NS}	0.56 ^{NS}	0.19 ^{NS}
Gender					
Male	59	1.06±1.79	2.22±1.14	1.62±2.31	3.71±3.33
Female	31	1.06±1.59	2.00±1.15	1.80±2.62	3.48±3.40
t value		0.009	0.86	0.33	0.30
p value		0.99 ^{NS}	0.39 ^{NS}	0.74 ^{NS}	0.76 ^{NS}

^{NS} significant ($p > 0.05$), NS=Non-Significant

N=90 (180 injection sites)

Table 09: Association of site pain intensity with clinical profile.

Clinical Profile	n	Pain at 0 hour			
		VAS		NPR	
		Exp. arm (n ₁ =90)	Control Arm (n ₂ =90)	Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)
		M±SD		M±SD	
Diagnosis					
Neurological	40	0.90±1.79	2.20±1.20	1.32 ±2.09	3.52 ±3.34
Renal	12	1.41±2.02	1.83±1.11	2.16 ±2.32	3.66 ±3.49
Respiratory	10	1.0 ±1.69	2.30 ±1.25	2.10 ±3.38	3.40 ±3.56
GI	08	0.62 ±0.91	1.87 ±1.12	1.37 ±2.77	3.25 ±3.28
Miscellaneous	07	1.27 ±1.69	2.28 ±1.11	1.42 ±1.90	4.28 ±3.63
Endocrine	06	0.50 ±0.83	1.83 ±0.98	0.83 ±1.32	3.16 ±3.60
CVS	04	2.25 ±2.06	2.75 ±0.95	3.25 ±2.76	4.50 ±3.31
orthopaedics	03	2.33 ±2.51	2.33 ±1.52	4.33 ±4.04	5.00 ±4.58
F value		0.83	2.49	0.67	1.58
p value		0.47 ^{NS}	0.06 ^{NS}	0.56 ^{NS}	0.19 ^{NS}
Co morbidities					
DM II	7	1.42±1.81	2.14±1.21	1.8571±2.19	3.57±3.99
DM I	3	3.33±2.88	2.66±1.52	4.00±3.46	5.33±4.61
HTN	3	-	2.00±1.73	-	2.33±4.04
F value		1.95	0.61	2.27	0.40
p value		0.19 ^{NS}	0.62 ^{NS}	0.15 ^{NS}	0.68 ^{NS}

^{NS} significant (p>0.05)

Table 10: Association of site pain intensity with clinical profile

N=90 (180 injection sites)

Clinical Profile		n	Pain at 0 hour			
			VAS		NPR	
			Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)	Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)
			M±SD		M±SD	
Anticoagulants						
Clexane	50	1.08±1.87	2.00±1.19	1.52±2.39	3.26±3.42	
Fragmin	40	1.05±1.53	2.32±1.07	1.90±2.45	4.10±3.21	
F value		0.0	1.80	0.54	1.40	
p value		0.93 ^{NS}	0.18 ^{NS}	0.46 ^{NS}	0.23 ^{NS}	
Antiplatelets						
Deplatt-A	4	3.50±2.38	3.00±1.41	4.50±3.00	6.50±4.35	
Clopidogrel	5	1.40±2.19	2.20±1.30	1.80±2.68	3.60±4.09	
F value		1.89	0.77	2.03	1.053	
p value		0.21 ^{NS}	0.40 ^{NS}	0.19 ^{NS}	0.33 ^{NS}	

^{NS} Significant (p>0.05)

Table 11: Association of bruising with socio demographic variables.
N=90(180 injection sites)

Socio bio demographic variables	n	Bruising					
		12 hours		24 hours		48 hours	
		Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)	Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)	Exp. Arm (n ₁ =90)	Control Arm (n ₂ =90)
		M±SD		M±SD		M±SD	
Age (in years)							
< 20	4	-	0.50 ±1.00	-	0.50±1.00	-	-
20-40	24	0.22 ±.55	1.75 ±2.78	0.22 ±.55	1.79±2.87	0.16±.48	1.72±2.84
40-60	30	0.41 ±.83	3.28 ±5.29	0.30 ±.74	3.61±5.98	0.20±.66	3.53±6.03
> 60	32	0.46 ±.70	3.15 ±6.64	0.43 ±.70	3.31±6.64	0.20±.50	3.17±6.64
F value		0.94	0.70	0.78	0.80	0.17	0.87
p value		0.42 ^{NS}	0.55 ^{NS}	0.50 ^{NS}	0.49 ^{NS}	0.91 ^{NS}	0.46 ^{NS}
Gender							
Male	59	0.29±.68	1.59±2.73	0.29±.68	1.62±2.75	0.14±.52	1.51±2.78
Female	31	0.50±.73	4.82±7.68	0.35±.64	5.27±8.09	0.25±.57	5.14±8.11
t value		1.31	2.90	0.39	3.14	.94	3.11
p value		0.19 ^{NS}	0.00**	0.69 ^{NS}	0.002*	0.34 ^{NS}	0.002*

*Significant at p<0.05, NS significant (p>0.05)

Table 12: Association of bruising with clinical profile.
N=90 (180 injection sites)

Clinical Profile	n	Bruising					
		12 hours		24 hours		48 hours	
		E (n ₁ =90)	C (n ₂ =90)	E (n ₁ =90)	C (n ₂ =90)	E (n ₁ =90)	C (n ₂ =90)
		M±SD		M±SD		M±SD	
Diagnosis							
Neurological	40	-	-	0.31±.62	3.02±6.22	0.13±.43	2.83±6.26
Renal	12	0.45±.72	1.50±1.08	0.45±.72	1.37±1.18	0.25±.45	1.41±1.56
Respiratory	10	0.45±.76	4.10±5.95	0.45±.76	4.10±5.95	0.30 ±.67	3.80±5.93
GI	08	0.37±.74	0.93±1.37	0.37±.74	0.75±1.38	0.25±.70	0.75±1.38
Miscellaneous	07	-	4.57±7.45	-	4.85±7.64	-	4.85±7.64
Endocrine	06	0.25±.61	1.00±1.54	-	1.00±1.54	-	1.00±1.54
CVS	04	0.50±1.0	5.0±6.87	-	5.00±6.87	-	4.87±6.90
Orthopaedics	03	1.00±1.73	5.00±6.87	1.00±1.73	5.00±8.66	1.00±1.73	5.00±8.66
F value		0.70	0.72	1.15	0.74	1.44	0.67
p value		0.66 ^{NS}	0.65 ^{NS}	0.34 ^{NS}	0.63 ^{NS}	0.19 ^{NS}	0.69 ^{NS}
Comorbidities							
DM I	7	-	0.66±1.15	-	0.66±1.15	-	0.66±1.15
DM II	3	0.42±0.78	4.0±5.0	0.14±0.37	3.85±5.14	-	3.64±5.21
HTN	3	-	0.33±0.57	-	0.33±0.57	-	0.16±0.28
F value	-	0.79	1.27	0.38	1.12	-	1.02
p value		0.47 ^{NS}	0.32 ^{NS}	0.69 ^{NS}	0.36 ^{NS}	-	0.39 ^{NS}

^{NS} significant (p>0.05) E: Exp. Arm, C: Control Arm

Table 13: Association of bruising with clinical profile
N=90 (180 injection sites)

Clinical Profile	n	12-48 hours (100 injection sites)					
		12 hours		24 hours		48 hours	
		E (n ₁ =90)	C (n ₂ =90)	E (n ₁ =90)	C (n ₂ =90)	E (n ₁ =90)	C (n ₂ =90)
		M±SD		M±SD			
Anticoagulants							
Clexane Fragmin	50	0.38 ±0.68	1.82 ±2.84	0.33 ±0.65	2.02 ±3.65	0.19 ±0.54	1.88 ±3.62
	40	0.35 ±0.73	3.81 ±7.04	0.30 ±0.68	3.96 ±7.04	0.17 ±0.54	3.87 ±7.08
F value		0.04	3.33	0.044	2.84	0.01	2.99
p value		0.84 ^{NS}	0.71 ^{NS}	0.83 ^{NS}	0.09 ^{NS}	0.89 ^{NS}	0.08 ^{NS}
Antiplatelets							
Deplatt-A	4	-	12.50 ±16.58	-	12.50±16.58	-	12.50±16.58
Clopidogrel	5	0.50 ±0.70	1.90 ±0.74	0.50 ±0.70	1.90±0.74	0.20±0.0	1.80 ±0.83
F value		1.94	2.11	1.94	2.11	0.77	2.151
p value		0.20 ^{NS}	0.18 ^{NS}	0.20 ^{NS}	0.18 ^{NS}	0.40 ^{NS}	0.18 ^{NS}

^{NS} significant ($p > 0.05$), E: Exp. Arm, C: Control Arm

Major findings of the study:

- In the present study mean age of 90 patients in both groups was 51.94 ±19.49 and majority of them were above 60 years of age.
- In both groups out of 90 patients most of the subjects were having neurological disorders 40 (44.4%).
- In both groups out of 13 patients most of them were suffering from DM type 2 i.e. 7 (53.84).
- More than half of patients have received Clexane 50 (55.6) as an anticoagulant.

- Mean platelet count of 90 patients was 266.49 ±123.21.
- The findings reveal that out of 90 subjects (Mean age 51.94 ±19.49). Mean difference in pain at 0 hour as per VAS (1.08 ±1.27) and NPR (1.94 ±2.40) in experimental arm and control arm at ($p=0.00$) while no pain was observed in 12 hours, 24 hours and 48 hours in both arms.
- There was a significant difference in extent of bruising in 12 hours (0.40 % vs 3.0 %) with Mean difference 2.40 ±5.44 mm at $p=0.00$ at 24 hours (0.35% vs 3.20 %) with Mean difference 2.56 ±5.40 mm at $p=0.00$ at 48 hours (0.20 % vs 3.07%) with Mean difference

2.58 $\pm$ 5.41 mmat $p=0.00$ in experimental arm and control arm respectively.

- No correlation was found among all study variables except gender in control arm with extent of bruising.

DISCUSSION

Section I: Discussion related to socio demographic and clinical profile.

The findings of the present study revealed that in both groups most of the patients were of age group more than 60 years with mean age of 51.94 ± 19.49 and more than half were men. Majority of the subjects were in both arms were having Neurological disorders and with more comorbidities of DM II. The mean platelet count of 2.66 ± 123.21 .

Section II (a): Discussion related to incidence of site pain intensity.

The findings of the present study revealed that according to VAS in Experimental arm median and interquartile range of pain intensity was 2 (1-3) and in NPR it was 2 (4-6). In control arm median and interquartile range of pain intensity according to VAS was 2 (4-6) and in NPR 6 (4-10) respectively.

Section II (b): Discussion related to incidence of extent bruising.

The findings of the present study examined the incidence of bruising at 0-hour, 12 hours, 24 hours and 48 hours. In control arm large bruises ($>5\text{mm}^2$) frequently occurred at 24 hours 13 (14.4%) and no bruises occurred at in experimental arm at 0 hour, 12 hours, 24 hours and 48 hours. Whereas small bruises most frequently occurred in control arm at 12 hours and 48 hours i.e. 16 (17.8%) and in experimental arm it was approximately same occurred at 12 hours 4 (4.4%), 24 hours 4 (4.4%) and 48 hours 3 (3.3%). Most frequently no bruising occurred at 0 hour in both experimental and control arm i.e. 90(100%).

Section II (c): Discussion related to comparison of site pain intensity among Experimental & Control group at different time intervals.

The findings of the present study revealed that the pain intensity at injection site was observed only at 0 hour in both experimental and control arm. The pain intensity was respectively more in control arm by VAS i.e. ($2.14 \pm 1.14 > 1.06 \pm 1.72$) in experimental arm. By NPR pain intensity in control arm ($3.63 \pm 3.34 > 1.68 \pm 2.41$). This study concluded that experimental arm had a significantly

less pain score as compared to control arm at ($p < 0.005$) respectively.

Section II (d): Discussion related to comparison of extent of bruising among Experimental & Control group at different time intervals.

The findings of the present study showed, that there was no bruising occurred at 0 hour in both experimental and control arm. The mean bruise score in experimental arm at 12 hours (0.36 ± 0.70), 24 hours (0.31 ± 0.66) and 48 hours (0.18 ± 0.54) was comparatively less than control arm at 12 hours (2.70 ± 5.21), 24 hours (2.88 ± 5.48) and 48 hours (2.76 ± 5.49). This study concluded that experimental group had a significantly less pain bruising as compared to control group at ($p < 0.005$) respectively.

Section III: Discussion related to association of site pain intensity & extent of bruising among with sociodemographic & Clinical profile of the patient.

The present study concluded that there was no significant association found in site pain intensity and extent of bruising with sociodemographic variables and clinical profile in both arms at $p > 0.05$ where as a significant association was found in females at 12 hours, 24 hours and 48 hours

with extent of bruising at injection site at $p = 0.00^*$.

Similar findings were reported by **Ahmadi M, Ahmadi R, Saadati Z et.al.** on 86 patients, who were treated with subcutaneous heparin twice in control group (10 seconds) and twice in research group (30 seconds). The evaluation of bruising and site pain intensity was observed in each group and ANOVA test showed that there was a statistically significant association found in between gender and bruise sizes after 48 hours and 72 hours of injection administration at $p = 0.001^5$.

CONCLUSION

The subjects developed more site pain (VAS & NPR) and small to large bruise in control arm (receiving fast LMWH inj.) as compared to experimental arm (receiving slow LMWH inj.) at $p = 0.00$. Therefore, slow LMWH is more effective in reducing site pain and bruise than fast LMWH injection.

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