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A study to compare the effect on application of sandbags after Percutaneous Coronary Intervention (Coronary Angioplasty) versus the effect of simultaneous sandbag -ice pack alternatively after Percutaneous Coronary Intervention at HCG Hubli Suchirayu Hospital.

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ABSTRACT

Introduction: This study aims to reveal that ice bag application to femoral region was effective in reducing pain induced by femoral catheter removal in patients who underwent Percutaneous Coronary Intervention (PCI).

Methodology: A experimental study was conducted among 40 patients undergoing femoral angioplasty admitted at selected Hospital at HCG Hubli Suchirayu Hospital**.** Purposive Random sampling technique was used and samples were divided into experimental group I & II. Group I was administered with sandbag for 4 hours period on the puncture site where in Group II was administered with sand bag – ice bag alternatively, 20 minutes with icepack and then for 60 minutes with sand bag. This cycle was repeated two times. The effectiveness on the level of Hematoma and Pain in experimental group I & II were compared at 15 Minutes,4 Hour ,48 Hours up to 72 hours. Observational tool was used for data collection and data was analyzed by descriptive and interference statistics.

Result: It was found that in comparison to the simultaneous use of ice bag and the sand bag, interventional group II was more effective than only sand bag intervention group I. On evaluation the Pain level at 15 minutes, 4 hours, 48 hours, and 72 hours in the experimental group I were 90%, 75%, 60% & 30% and in Group II were 90%, 70%, 30% & 10%. Hemorrhage was noted in both the Group I & II at 15 minutes were 25% & 10% and 0% at others different interval which in turn prevented hematoma formation in patient post PCI.

Conclusion: The simultaneous sand-ice bag application reduces post-PCI Hematoma rate & pain through compression and vasoconstriction. Localized sand - ice bag application may therefore be recommended as a nursing intervention for pain control in such cases.

KEYWORDS-: Hematoma, Pain, Sand Bag, Ice Bag - Sand Bag, Per Cutaneous Intervention

1. INTRODUCTION

The femoral arterial site has been the most used for percutaneous coronary intervention (PCI). However, during femoral artery interventions, many patients experience pain and discomfort during the removal of catheters previously inserted into the femoral region[1,2], alongside they even develop hematoma at puncture site therefore, it is important to reduce the discomfort experienced by patients undergoing this procedure.[3]

Pain may also be controlled using nonpharmacological methods, which are patient-specific and can be controlled by establishing emphatical communication with healthcare staff.[4,5] Nonpharmacological methods used for pain control provided positive effects such as reduced anxiety and psychological support; notably, patients have expressed satisfaction with such nonpharmacological methods.[6] Cold application is a nonpharmacological method of pain control.[7] Being one of the oldest and easiest forms of treatment, cold application increases the threshold of pain and reduces the conduction velocity of nerve fibres transmitting pain

stimuli from the peripheral to the central nervous system. Study conducted by Ertug and Ulker showed that cold application was highly effective in reducing the pain caused by chest tube removal.[8] Cold application also confers other advantages like reducing and preventing the hematoma at puncture by inducing vasoconstriction.[9]

2. MATERIALS & METHODS

The study was conducted as a randomized interventional trial among 40 patients admitted for coronary angioplasty at selected hospital of HCGEL. Patients were divided into two experimental groups (I & II) by randomization. Eligible patients were informed both verbally and in writing, and their written informed consent was obtained. To conduct the study, the necessary written permissions were obtained from Ethics Committee.

Samples were randomly divided into Experimental group I (Only sand bag) & experimental group II (Simultaneous ice pack - sandbag). Patients who underwent PCI procedure were the sample's, purposive random sampling technique was followed. Inclusion criteria were-age above 18years, underwent a femoral intervention, had no active bleeding before the catheter withdrawal immediately post procedure. Exclusion criteria were- having known bleeding disorders, developed active bleeding at catheter insertion site before sheath removal, experiencing lower back pain before the procedure, developed any complications during the procedure, systolic blood pressure greater than 190 mmHg or diastolic blood pressure greater than 110 mmHg and demographic data. The data was collected by using observational tool and analyzed by descriptive and interference statistics. In the experimental group I, a sand bag was placed on the location for up to 4 hours. In the experimental group II, the ice bag and the sand bag were used simultaneously for 20 minutes, and then for 60 minutes, with the pressure of the sand bag only. This cycle was repeated two times. Pain at puncture site, hemorrhage (volume and weight) and hematoma (area and lump) were checked four times.

3. RESULTS

Table 1 shows the percentage wise distribution of socio-demographic variables

N=40

The Effect of Simultaneous Sand-Ice Bag alternatively on Hematoma after Percutaneous Coronary Intervention			
Sl No	**Socio demographic variables**	**Experimental Group-I (Only Sand bag)**	**Experimental Group -II (Simultaneous Sandbag & Ice pack)**
1	**Gender**		
	Male	85%	90%
	Female	15%	10%
2	**Age**		
	Below 55 years	30%	30%
	56 to 65	55%	45%
	Above 65	15%	25%

In Demographic data we have found that in experimental group-I sand bag was effective among 85% of males & 90% effective among experimental group-II sandbag & ice bag males. Among females 15% was effective in experimental group-I and 10% effective in experimental group-II. We found that age group below 55 years in both experimental I & experimental II was 30% and 55 to 65 years in experimental I & II was 55% & 45%, above 66 years of age the experiment group I& II was 15% & 25% respectively.

The Effect of Simultaneous Sand-Ice Bag alternatively on Hematoma after Percutaneous Coronary Intervention			
Sl No	**Socio demographic variables**	**Experimental Group 1 (Only Sandbag)**	**Experimental Group 2 (Simultaneous Sandbag & Ice pack)**
3	**BMI**		
	18.5-24.5	10%	0%
	25.0-29.0	50%	50%
	30.0- Over	40%	50%
4	**Medical History**	Yes	Yes
	Any Chronic Disease	25%	20%
	Hypertension	40%	40%
	Disbetes Mellitus	35%	40%

Body Mass Index 18.5-24.5, 24.5-29 & more than 30 in experimental group 1 was 10%.50% &40% & BMI in 18.5-24.5, 24.5-29 & 30 in experimental group 2 was 0%, 50% & 50% respectively. In terms of medical history, we found that in experimental group I were any Chronic Diseases, Hypertension, Diabetes Mellitus 25%, 40%, &35% and in experimental group II were 20%, 40%, & 40% respectively.

Table 2 shows the percentage wise distribution of clinical variables **N=40**

Sl No	**Clinical variables**	**Experimental Group 1 (Only Sand bag)**	**Experimental Group 2 (Simultaneous Sandbag & Ice pack)**
1	**Drug use Status**		
		Yes	**Yes**
	Antihypertensive Drug	40%	40%
	Antidiabetic Drug	35%	40%
	Anticoagulant Drug	25%	20%
2	**Laboratory Values**		
	HB	In Normal range	
	APTT		
	PT		
	INR		
3	**Catheter Used**	**Yes**	**Yes**
	7F	5%	5%
	6F	95%	95%

We have assessed Hematoma assessment tool and found that drug used status of the patient in experimental group I was antihypertensive, antidiabetic, anticoagulant drugs were 40%, 25%, 35% and experimental group II was 40%, 40%, 20%. Laboratory values of Hb, APTT, PT, INR in both the groups were in normal range. Catheter used in each group was 7f & 6f were 5% & 95% respectively.

Sl No	Clinical variables	Experimental Group I (Only Sand bag)	Experimental Group II (Simultaneous Sandbag & Ice pack)
4	**Haematoma**		
	At 15th min	90%	90%
	At 4th hour	75%	70%
	At 48th hour	60%	30%
	At 72th hour	35%	10%

We found the hematoma after 15min, 4hours, 48hours, 72 hours on experimental group I was 90%,75%,60% and 35% and hematoma found in experimental group II were 90%,70%,30% & 10%

Sl No	Clinical variables	Experimental Group 1 (Only Sand bag)	Experimental Group 2 (Simultaneous Sandbag & Ice pack)
5	**Pain**	**Yes**	**Yes**
	At 15th min	90%	90%
	At 4th hour	75%	70%
	At 48th hour	60%	30%
	At 72th hour	30%	10%
6	**Ecchymosis**	**Yes**	**Yes**
	At 15th min	90%	90%
	At 4th hour	80%	60%
	At 48th hour	60%	30%
	At 72th hour	25%	10%
7	**Haemorrhage**	**Yes**	**Yes**
	At 15th min	25%	10%
	At 4th hour	0%	0%
	At 48th hour	0%	0%
	At 72th hour	0%	0%
8	**Duration**	**Yes**	**Yes**
	Sand Bag (1 Hr)	100%	100%
	Ice pack (20 mins)	100%	100%

Assessed the pain at 15 minutes, 4hours, 48hours and 72 hours in both the experimental group I & II were 90%,75%,60% & 30% and 90%,70%,30% & 10%.Ecchymosis at different interval of time 15 minutes, 4 hours, 48hours,72 hours were in group I & II was 90%,80%,60%,25% in the group II it was 90%,60%,30% ,10%.Haemmorage present in both the Group I at different interval of time was 25% after 15minutes and 10% in group% others different interval of time were 0%.

4. DISCUSSION

The similar study was conducted by V Maryam in 2020 as a randomized clinical trial among 60 patients with femoral angioplasty. The results showed that the rate of hemorrhage after intervention was significantly reduced

in the intervention group compared to the control group. Although the incidence of hematoma in the intervention group decreased than control group from 20% to 6.7%, but the statistical test was not significant.[10] In a further study by Ertug and Ulker, cold application was highly effective in reducing the pain caused by chest tube removal.[8] Cold application also confers other advantages, such as ease of application, the lack of serious side effects, and low cost.[11]

In the experimental group I, a sand bag was placed on the location for up to 4 hours. In the experimental group II group, the ice bag and the sand bag were used simultaneously for 20 minutes, and then for 60 minutes, with the pressure of the sand bag only. This cycle was repeated four times. Hemorrhage (volume and weight) and hematoma (area and lump) were checked four times. The data were analyzed using observational tool. According to the results of this experimental study, the simultaneous sand-ice bag application can reduce post-PCI hematoma rate & pain through compression and vasoconstriction.

The similar study can be conducted with larger samples for better generalization, study could also be conducted at other institutions where the practices of catheterization and removal make difference in prevention of hematoma with same experimental group. It is recommended to conduct future randomized controlled studies that compare the efficiency of ice pack application in pain, experienced during the catheter removal, by using different non pharmacological methods.

5. CONCLUSION

Pain causes analgesic consumption and increases the additional analgesic needs of patients. [12] Previous studies also reported that analgesic therapies are required in order to control the pain associated with removal of the femoral arterial catheter following PCI because pharmacological methods of pain management are associated with side effects, nonpharmacological therapies should be considered as alternatives.[13] Therefore, it appears to be important to control the pain before it starts during invasive interventions that cause pain experience in patients and to take nonpharmacological methods such as cold application into account in pain control to reduce the patient's analgesic requirements. The results of the study revealed that sand-ice bag application was effective in reducing pain caused by removal of femoral catheter after PCI procedure.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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