



EFFECT OF APPLICATION OF AN ICE BAG ON PAIN DURING REMOVAL OF FEMORAL INTRODUCER SHEATH AMONG PATIENTS UNDERGOING INTERVENTIONAL CARDIOLOGY PROCEDURES IN A SELECTED HOSPITAL

Mrs Neha Nitin Patil*	Msc Nursing student, Dr D Y Patil Vidyapeeth, Dr D Y Patil College of Nursing, Pimpri, Pune, Maharashtra.*Corresponding Author
Mrs D Priya	Assistant Professor Department and institution: Dr D Y Patil Vidyapeeth, Dr D Y Patil College of Nursing, Pimpri, Pune, Maharashtra.
Dr Mrs Rupali Salvi	Principal - Department and institution: Dr D Y Patil Vidyapeeth, Dr D Y Patil College of Nursing, Pimpri, Pune, Maharashtra.
Dr Mrs Nisha Naik	Research Coordinator - Department and institution: Dr D Y Patil Vidyapeeth, Dr D Y Patil College of Nursing, Pimpri, Pune, Maharashtra.

ABSTRACT **Aims:** The present study aimed at assessing the effect of application of ice bag on pain during removal of femoral introducer sheath among patients undergoing interventional cardiology procedures. **Settings:** Dr. D Y Patil Hospital and Research Centre, Pimpri, Pune. **Design:** Quasi experimental post-test control group design **Methods and Material:** Sampling technique: Purposive sampling technique was used to select the samples. **Sample size:** In this study, sample size was of 60, out of which 30 samples were experimental group and 30 samples were in the control group. **Assumption:** It is assumed that the pain will reduce on application of ice bag during removal of femoral introducer sheath. **Hypothesis:** H₁: There will be a significant difference in the pain score level after ice bag application on patients during removal of femoral introducer sheath. H₂: There will be an association between pain and clinical profile of patients with femoral sheath. **Statistical analysis used:** The Investigator analyses the data using Descriptive and Inferential Statistics and presents them in tables, graphs and figures. The following plan of analysis was done based on objectives. **Results:** Result shows it is evident that the pain in experimental group had reduced significantly as compared to that in the control group. The application of ice bag had an effect on pain during removal of femoral sheath. **Conclusions:** The study concluded that the application of ice bag during removal of femoral sheath had a significant effect on reduction of pain and therefore, it should be considered as a non-pharmacological measure in reducing pain.

KEYWORDS :

Introduction:

Cardiovascular diseases (CVDs) are the number one causes of death globally, taking an estimated 17.9 million lives each year.^{1,2} According to NHANES (National Health and Nutrition Examination Survey 2013 to 2016 data, the prevalence of Cardio Vascular Diseases (comprising CHD, HF, stroke, and hypertension) in adults ≥ 20 years of age is 48.0% overall (121.5 million in 2016) and increases with advancing age in both males and females. CVD prevalence excluding hypertension (CHD, HF, and stroke only) is 9.0% overall (24.3 million in 2016).³

The researcher has adopted research design as Quasi experimental post-test only control group design. The samples are selected by non-purposive sampling technique. In this study sample size was of 60 out of which 30 samples were experiment group and 30 samples were control group. Analysis of data were related to pain and application of icebag, researcher applied two sample t-test for the comparison of pain and application of ice bag in experimental and control group. Corresponding p-values were small (less than 0.05) therefore it is evident that the pain in experimental group reduced significantly when compared with that of the control group.

Background of the study:

Cardiac catheterization involves the insertion of catheters and guide wires into the cardiovascular circulation through a femoral introducer sheath for evaluation of various cardiac ailments. Pain can cause vasovagal reaction a potentially serious complication associated with bradycardia and hypotension in some patients. Cold application has been preferred due to its physiological effects such as vasoconstriction, increase in blood viscosity and anaesthetic effect. It also helps to reduce blood flow and capillary permeability by vasoconstriction thereby reducing bleeding.⁴

Need for the study:

WHO report had predicted that in the year 2020, 2.6 million Indians will die of coronary heart diseases (CHDs), which constitute 54.1% of all Cardiovascular death. Moreover, around half of these deaths are likely to strike young and middle-aged individuals in the age group of 30 to 69 years, whereas only 23% of CHD-related deaths in Western countries occur in this age group. It was observed that women between the age group of 40 - 60 are getting more prone to CVDs because of

their drastic lifestyle changes.⁹ Fever in one of the leading causes of death among children. As per study done in Oct 4, 2017, on fever which are not differentiated in India and findings were, malaria positivity was found in seventeen percentage, dengue in sixteen percentage, scrub typhus in ten percentage, bacteraemia in eight percentage, leptospirosis in seven percentage and chikungunya in six percentage.⁵

Cryotherapy, which is also known as ice application, has been one of the simplest and oldest ways to treat injuries. Ice is believed to control pain by inducing local anaesthesia and it also decreases oedema, ecchymosis, hematoma by decreasing local blood flow. The cryotherapy effect depends on the method, the duration, temperature of the ice and the depth of the subcutaneous fat.⁶

Research Methodology:

Research approach

An evaluative approach for this study in order to accomplish the objectives. Evaluative research deals with the questions of how well the program meets the objectives of this study. Quantitative approach was used.

Research design

Quasi experimental post-test control group design was used for this study.

Setting

The main research was done in Dr. D Y Patil Hospital and Research Centre, Pimpri, Pune.

Population

The population in this study will be referred to adults undergoing interventional cardiology procedures with a femoral sheath.

Method of data collection:

Sampling technique

Non -Purposive sampling technique.

Sample size

In this study sample size was of 60. Experimental group 30 samples and control group 30 samples.

Sampling criteria

Inclusion criteria:

- Patients who are willing to participate in the study.
- Patients who have a femoral sheath

Exclusive criteria:

- An oozing haemorrhage, hematoma, and ecchymosis of the femoral artery region prior to catheter withdrawal.

Tools And Techniques:

In this study

SECTION A- Demographic Data consists of 5 items seeking information on subject's age, gender, marital status, and educational status.

SECTION B- Clinical Profile- It includes the clinical profile of the patients including provisional diagnosis, types of chronic disease, type of procedure and intervention time. It also consists of biophysiological parameters such as heart rate, blood pressure, respiration and oxygen saturation.

SECTION C: Numerical Pain Rating Scale (Stanford) is a ten-point scale for pain score.

Results: Analysis and Interpretation of Data

SECTION A

Table 1: Description of samples (patients undergoing interventional cardiology procedures) based on their demographic characteristics in terms of frequency and percentages.

N=30, 30

Demographic variable	Control group		Experimental group	
	Freq	%	Freq	%
Age				
25 – 35 years	2	6.7%	2	6.7%
36 – 45 years	6	20.0%	5	16.7%
46 – 55 years	13	43.3%	13	43.3%
> 56 years	9	30.0%	10	33.3%
Gender				
Male	21	70.0%	21	70.0%
Female	9	30.0%	9	30.0%
Marital status				
Married	20	66.7%	20	66.7%
Unmarried	8	26.7%	8	26.7%
Widow/Widower	2	6.6%	2	6.6%
Educational status				
No formal education	9	30.0%	9	30.0%
Primary School Certificate	14	46.7%	15	50.0%
Secondary School Certificate	7	23.3%	6	20.0%

Table 2: Effect of ice bag application on pain during removal of femoral introducer sheath in experimental and control group

N=30, 30

Pain	Control group		Experimental group	
	Frequency	Percentage %	Frequency	Percentage %
No pain (Score 0)	0	0.0	0	0.0
Mild (Score 1-3)	0	0.0	7	23.3
Moderate (Score 4-6)	11	36.7	20	66.7
Severe (Score 7-9)	19	63.3	3	10.0
Worst (Score 10)	0	0.0	0	0.0

Table 3: Two sample t-test for the comparison of pain during removal of femoral introducer sheath in experimental and control group.

N=30, 30

Group	Mean	SD	t	df	p-value
Control	6.6	0.49	10.0	58	0.000

Experimental	4.3	1.15			
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Table 4: Fisher's exact test for the association between pain and selected demographic variables in experimental group.

N=30, 30

Demographic variable		Pain			p-value
		Mild	Moderate	Severe	
Age	25 – 35 years	0	2	0	0.397
	36 – 45 years	0	4	1	
	46 – 55 years	5	6	2	
	> 56 years	2	8	0	
Gender	Male	7	14	0	0.005
	Female	0	6	3	
Marital status	Married	6	12	2	0.924
	Unmarried	1	6	1	
	Widow/Widower	0	2	0	
Educational status	No formal education	1	7	1	0.835
	Primary School Certificate	4	9	2	
	Secondary School Certificate	2	4	0	

Analysis of data related to association between pain and clinical profile.

Table 5: Fisher's exact test for the association between pain and clinical profile variables in experimental group.

N=30, 30

Clinical variable		Pain			p-value
		Mild	Moderate	Severe	
Provisional diagnosis	ACS	0	4	0	0.406
	AMI	1	4	1	
	ASD	0	1	1	
	AWMI	0	3	0	
	CAD	2	5	0	
	Carotid stenosis	1	0	0	
	IWMI	1	1	0	
	Left lower limb radiating pain	2	1	1	
	Liver parenchymal disease	0	1	0	
Types of Chronic diseases	DM	2	4	1	0.938
	DM, High BP	3	4	1	
	High BP	1	5	0	
	LOW EF, DM	0	3	0	
	NIL	1	4	1	
Type of Procedure	Carotid Stenting	1	0	0	0.182
	ASD Closure	0	1	1	
	PTCA	6	19	2	
Size of the catheter	6 Fr	7	11	2	0.091
	7 Fr	0	9	1	
Intervention time	30 mins	1	4	0	1.000
	45 mins	4	12	2	
	60 mins	2	4	1	

Since all the p-values are large (greater than 0.05), none of the clinical variables was found to have significant association with the pain during removal of femoral introducer sheath in control group.

Discussion

Analysis revealed that the majority of the samples 70% were males, which was similar to a study conducted by Sevda Korkut Bayindir7 et al (2017) in which majority 75% of the patients were males. Our study

revealed that majority of the samples 76.7% in the control group had grimaces on their face and also cried during sheath removal which is similar to the above study where it was observed that the majority of patients in the control group showed reactions, such as wincing, fist clenching, intervening with hands, biting fingers or lips, grinding teeth, and crying or moaning. It was seen in our study that the average pain score in control group was 6.6 whereas it was 4.3 in the experimental group which is similar to the above study where both study groups experienced pain, variables were found to have significant association with the pain during removal of femoral introducer sheath in experimental group

A similar study was conducted by Gulsum Nihal Suruk 8, (2017) that ice application for 20 minutes could reduce complications and decrease pain after removal of femoral sheath. The above study emphasized that cold application had an effect on pain during removal of femoral sheath.

Subsequently a similar study was conducted by Shima El Sayed Ibrahim9 to assess the effectiveness of using ice pack application on vascular access complications after cardiac catheterization. This study hypothesized that the patients who received ice application are more likely to experience less pain at vascular access site than who received routine hospital care.

Conclusion

The researchers overall experience in conducting the study was a satisfying one as there was co-operation from the participants. The purpose of this research was to assess the outcome of ice bag application on pain during removal of femoral introducer sheath.

Analysis revealed that the majority of the samples 70% were males, which was similar to a study conducted by Sevda Korkut Bayindir7 et al (2017) in which majority 75% of the patients were males. The majority of samples in our study were in the age group of 46-55 years of age whereas in this study they were in the age group of 51-77 years. Analysis revealed that 23.3% of the samples had coronary artery disease, similar to the above study where majority of the samples had coronary artery disease.

The study concluded that ice bag application remarkably reduces the pain during removal of femoral sheath among patients undergoing interventional cardiology procedures and therefore it should be considered as one of the non-pharmacological measures in pain management.

Limitations

- No broad generalization could be made due to small sample size and limited area of setting.
- Analysis of the study is based on the numerical pain rating scale and responses given by the subjects.

Recommendations

- A similar study may be replicated using a larger population and a different setting.
- A comparative study can be conducted on effect of ice bag application and other non-pharmacological methods during removal of femoral sheath.
- A study can be conducted to assess the effect of sand bag application to reduce ecchymosis during removal of femoral sheath.

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