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RESEARCH ARTICLE

QUASI-EXPERIMENTAL STUDY TO ASSESS THE LEVEL OF PAIN AFTER APPLICATION OF COLD GEL PACK DURING ARTERIOVENOUS FISTULA CANNULATION AMONG HAEMODIALYSIS PATIENT'S

[1]Dr. Vijay Kumar Gauttam and [2]Mr. Harsh Koshti

[1]Principal (I/C), IKDRC College of Nursing, Govt. of Gujarat, Ahmedabad-Gujarat (India); [2]M.Sc. Nursing, IKDRC College of Nursing, Govt. of Gujarat, Ahmedabad-Gujarat (India)

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***Corresponding author:**
Dr. Vijay Kumar Gauttam

ABSTRACT

Background: Arteriovenous fistulas are common form of chronic haemodialysis access. Pain during areteriovenous fistulacannulation remains a common problem in haemodialysis patients. The aim of the study is to assess the level of pain after application of cold gel pack during arteriovenous fistula cannulation among haemodialysis patients. **Methodology:** The research adopted for the study was quantitative research approach using quasi-experimental research design under post-test research design.A convenient sampling technique was used for selecting sample of 60 patients (30 each in experimental and control groups) who were undergoing haemodialysis by using arteriovenous fistula cannulation at IKDRC-ITS hospital, Ahmedabad.A modified numerical pain scale (Mc Caffery and Beebe, 1989) was developed to assess the effectiveness of cold gel pack application and pain related responses during AVF puncture. Descriptive and inferential statistics was used to analyse the data. **Results:** Majority 20 (66.67%)in experimental group and 20 (66.67%)in control group ofsamples were male belongs to the age group of 28-50 years. The mean score in experimental group was 4.2 and control group was 5.76 with mean difference was 1.56. The calculated "t" value in experimental group and control group was 4.43 and tabulated "t" value was 2.05 at 0.05 level of significance. **Conclusion:** The mean control group pain score was significantly higher than mean experimental group pain scores.Therefore, the null hypothesis H0 was rejected and research hypothesis H1was accepted and it revealed that the cold gel pack application was effective in terms of pain management among the patients.

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INTRODUCTION

Hemodialysis as one of the most common methods of renal replacement therapy is a stressful procedure despite to maintain the survival of patients with chronic kidney disease that permanent and safe vascular access is one of the requirements of a successful haemodialysis. Using arteriovenous fistula is the preferred method for safe vascular access in patients undergoing long-term haemodialysis.[1] Haemodialysis (HD) patients frequently complain of pain. About 75% of haemodialysis patients suffer from untreated or inadequately treated pain, ranging from moderate to severe.[2] Untreated pain in this population has a detrimental effect on mortality, dialysis adherence, healthcare use, and health-related quality of life.[3] Pain is an inevitable experience during arteriovenous fistulacannulation in haemodialysis patients. Local anaesthesia is one of the options to ease pain during arteriovenous fistulacannulation and may be ineffective due to vasoconstriction, burning sensation, scarring, and infection. The patient on maintenance haemodialysis is left to endure the pain as he/she undergoes 10 arteriovenous fistula punctures a month and would continue until a successful renal transplant. It is important, therefore, to consider his or her comfort with the procedure to encourage long-term compliance with the treatment.[4] Relief from pain during cannulation influences the acceptance of the procedure and will impact on the quality of life for the haemodialysis patients.[5] Assessment and management of pain are considered as the nursing priority and one of the important aspects of clinical nursing. Therefore, the need to find the new agents with maximum effect and minimal side effects, which accepted by all patient. The cold gel packs therapy is one of the cutaneous stimulation methods. It is a simple method that takes an important place among non-pharmaceutical treatments for pain control. [6]

METHODOLOGY

This study was conducted on 60 patients (30 each in experimental and control groups) undergoing haemodialysis by using arteriovenous fistula cannulation at IKDRC-ITS hospital, Ahmedabad.

Objective of the Study

- To assess the level of pain after application of cold gel pack during Arteriovenous Fistula cannulation among experimental and control group.

Inclusion Criteria

- Patient who are above the 18 years of age.
- Patient who will be available at the time of data collection.
- Patient who are willing and able to participate in the study

Exclusion Criteria

- Patient with neurological disorder who was not able to perceive pain.
- Patient who were receiving analgesics such as opioid analgesics group.

Method of Data Collection: This study was carried out in Medical-Surgical Nursing department of our institute after getting clearance from the ethical committee (GUTS/Ec-07-Nur-12) of the institute. Details of the entire study procedure was explained to the patients and after getting them fully satisfied, a written consent was obtained. Investigator developed the modified subjective numerical pain scale for the study to assess the effectiveness of cold gel pack application. Section I: Demographic variables which include 6 items such as Age, Gender, Duration of CKD, and Frequency of dialysis per week, size of cannulation, and presence of AVF in an arm. Section II: Subjective numerical pain scale (Mc caffery and beebe, 1989) to assess the pain related response. The pain scale constituted of total 10 pain score, which were divided into four levels that 0 = No pain, 1-3 = Mild pain, 4-6=Moderate pain, 7-10=Severe pain.

RESULTS

Table-1 shows that demographic distribution according to age most of the samples in experimental group 12(40%) sampleswere above 47 years and in control group 10 (33.33%) samples were from 28 to 37 years.

As regard to gender in experimental group 20(66.66%) samples were male, 10(33.33%) were female and control group 20(66.7%) were male, 10(33.3%) were female. Distribution of samples according to site of AVF in arm in experimental group 9(30%) was right arm, and 21(70%) samples was left arm. In control group 13(43.33%) samples was right arm, and 17(56.66%) samples was left arm. Duration of CKD and its treatment in experimental group 13(43.33%) samples having 3 years of duration. In control group 5(16.66%) samples have < 1 year duration, 12(40%) have 1 to 2 years of duration, 9(30%) have 2 to 3 years of duration, 4(13.33%) have >3 years of duration. Frequency of Haemodialysis per week in experimental group 4(13.33%) samples one time per week, 21(70%) samples two times per week, and 5(16.66%) sample three times per week . In control group 2(6.66%) samples one time per week, 20(66.66%) samples two times per week, and 8(26.66%) sample three times per week. In the experimental group, 30 (100%) participants were cannulated with a 17G cannula. Similarly, in the control group, 30 (100%) participants were cannulated with a 17G cannula. Table-2 shows that the level of pain in experimental group was having a moderate pain 20 (66.66), mild pain 10 (33.33) and in control group majority of sample having moderate pain 21(70) and severe pain 9 (30). Table-3 shows that the mean score in experimental group was 4.2 and in control group was 5.76 with the mean difference of 1.56. The standard deviation in experimental group was 1.39 and in control group was 1.33. The calculated't' value was 4.43 and the tabulated't' value was 2.05 at 0.05 level of significance.Therefore, the null hypothesis H_0 was rejected and research hypothesis $H_1$was accepted and it revealed that the cold gel pack application was effective in terms of pain management among the samples.

DISCUSSION

The present study was conducted to assess the effectiveness of cold gel pack application on level of pain related to arteriovenous fistula (AVF) puncture during haemodialysis at IKDRC-ITS, Ahmedabad, Gujarat. The investigator had administered the treatment of cold gel pack application in experimental group of the 30 samples and without cold gel pack application in control group of 30 samples to assess the pain level. It was revealed that mean pain score of control group 5.76 was higher than the mean pain score of experimental group 4.2 with the mean difference of 1.566 which was statistically proved and it revealed that the cold gel

Table 1. Frequency percentage distributions of sample characteristics

N=60

Sr. No.	Demographic Variable	Variables	Experimental Group (n=30)		Control Group (n=30)	
			Frequency	Percentage	Frequency	Percentage
1.	Age group (Years)	18-27	6	20	7	23.33
		28-37	9	30	10	33.33
		38-47	3	10	6	20
		>47	12	40	7	23.33
2.	Gender	Male	20	66.66	20	66.66
		Female	10	33.33	10	33.33
		Transgender	0	0	0	0
3.	Site of AVF in Arm	Right Arm	9	30	13	43.33
		Left Arm	21	70	17	56.66
4.	Duration of CKD	<1 Year	13	43.33	5	16.66
		1-2 Year	10	33.33	12	40
		2-3 Year	0	0	9	30
		>3 Year	7	23.33	4	13.33
5.	Frequency of Dialysis	1 per week	4	13.33	2	6.66
		2 per week	21	70	20	66.66
		3 per week	5	16.66	8	26.66
6.	Size of cannula	16 G	0	0	0	0
		17 G	30	100	30	100

Table 2. Analysis of level of pain score in experimental group and control group.

N=60

Level of Pain	Experimental Group (n=30)		Control Group (n=30)	
	Frequency	Percentage	Frequency	Percentage
No Pain (0)	0	0	0	0
Mild Pain (1-3)	10	33.33	0	0
Moderate Pain (4-6)	20	66.66	21	70
Severe Pain (7-10)	0	0	9	30

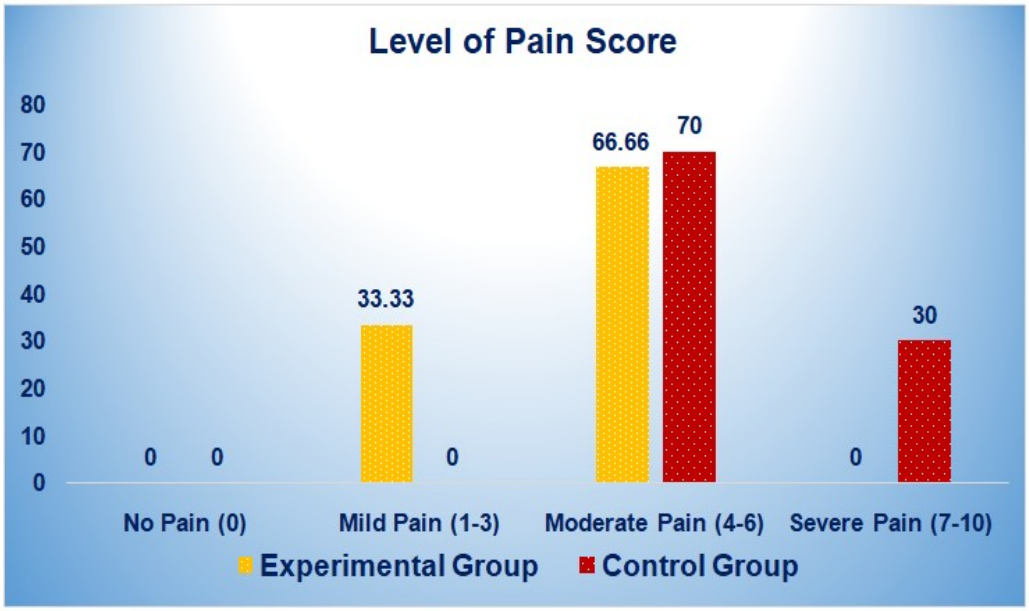

Table-3: Mean, Mean Difference, Standard Deviation (SD) and‘t’ test value in experimental and control group

N=60

Group	Mean Score	Mean Difference	SD	Calculated ‘t’ value	Table ‘t’ value	DF	Level of significance
Experimental Group (n=30)	4.2	1.56	1.39	4.43	2.05	29	0.05
Control Group (n=30)	5.76		1.33				

pack application was effective in terms of pain management during arteriovenous fistula puncture. A similar study was conducted by TamboliShakil S. et al (2023), toevaluate the effectiveness of cryotherapy on level of pain related to arteriovenous fistula among patients undergoing haemodialysis.The mean of posttest pain score 4.2 was less than that of mean of pretest pain score 7.03, it reveals significant reduction in level of pain. Calculated‘t’ test value 9.71 was greater than tabulated t test value 1.69 at 0.05 level of significance, it proves statistically that the cryotherapy was effective in reducing arteriovenous fistula related pain.

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