Original Research Article **Nursing**

International Journal of Pharma and Bio Sciences

ISSN 0975-6299

ASSESS THE EFFECTIVENESS OF CRYOTHERAPY ON ARTERIO VENOUS FISTULA PUNCTURE SITE PAIN AMONG PATIENTS ON HAEMODIALYSIS

S.BENIN SUNDAR[1]*, DR. P.MANGALA GOWRI[2] AND DR. S.ARUNA[3]

[1]M.Sc Nursing Student, Saveetha College of Nursing, Saveetha University, Chennai, India.
[2]Principal, Saveetha College of Nursing, Saveetha University, Chennai, India.
[3]Head of the Department Medical Surgical Nursing, Saveetha College of Nursing, Saveetha University, Chennai, India.

ABSTRACT

This study was intended to evaluate the effectiveness of cryotherapy on Arterio Venous Fistula puncture site pain among patients on Haemodialysis. A Quasi-experimental design (pre-post test) was used. 60 samples were selected by convenient sampling technique, 30 were divided each in the experimental and control group. Demographic variable was collected by using structured questionaire then the pre test level of pain during AV fistula puncture site was assessed by numerical pain rating scale to both groups.The second day the experimental group patients was given cold application and the control group patients was continue the routine treatment.post test level of pain was assessed for both experimental and control group. Findings: In pre test, In experimental group, 14(46.67%) had moderate, 10(33.33%) had severe and 6(20%) had mild level of pain. In control group 15(50%) had moderate, 10(33.33%) had severe and 5(16.67%) had mild level of pain. In post test, In experimental group 14(46.67%) had mild, 13(43.33%) had moderate and only 3(10%) had severe level of pain. In control group, 16(53.33%) had moderate, 9(30%) had severe and 5(16.67%) had mild level of pain. It was statistically significant at $P < 0.001$. Total number of dialysis session attended had shown statistically significant association with post test level of pain in the experimental group at $p<0.05$ level.Conclusion: This study indicates that cryotherapy is a simple non-pharmacological and cost effective method. It is effective in reducing pain among Haemodialysis patients with AV Fistula puncture site pain.

KEY WORDS: *Cryotherapy, Haemodialysis, Pain*

S.BENIN SUNDAR*

M.Sc Nursing Student, Saveetha College of Nursing, Saveetha University, Chennai, India.

Received on: 04-01-2017
Revised and Accepted on: 05-05-2017
DOI: http://dx.doi.org/10.22376/ijpbs.2017.8.3.b69-76

INTRODUCTION

Chronic Kidney Disease is now the 3rd most common non-communicable disease in India. Kidney diseases are the 12th cause of death and the 17th cause of disability respectively (National Kidney Foundation). Chronic renal failure is a devastating medical, social, and economic problem for both patients and their families in India.[2] Most Chronic Kidney Diseases patients reporting to tertiary care centres in India are in the final stage where renal replacement therapy (RRT) is the only option at that stage. Hemodialysis (HD) is the most frequently used renal replacement therapy with the arteriovenous fistula (AVF) being the gold standard for vascular access in HD patients.[3,4]Chronic Kidney disease involves progressive, irreversible loss of kidney function. It is defined as either the presence of kidney damage or Glomerular filtration rate (GFR) <60 ml/min for 3 months or longer Dialysis or a kidney transplant is required to survive Dialysis is treatment for patients with temporary or permanent kidney failure. Haemodialysis is the most commonly used method of dialysis .Haemodialysis is a life-saving procedure removes blood from the body, circulates it through a purifying dialyzer and then returns the blood to the body. Various access sites can be used for this procedure. The most common access device for long-term treatment is an Arterio venous fistula. India has close to 950 nephrologists all over the country. There are 700 dialysis centres with a total of 4000 dialysis machines. There are around 20,000 patients undergoing dialysis at these centres. There are around 170 government recognized transplant centres in India, Performing around 3500 transplants annually. A survey conducted by Dr. Mini sun park (2012) estimated that about 1, 00,000 persons suffer end stage renal disease every year in India. In which about 14,500 patients on Haemodialysis. Anupama (2012**)** done a prevention study in Chennai, the prevalence of Chronic Kidney disease at the community level is 8600 per million population in the study group and 13900 per million populations in the control group, patients with end-stage renal disease undergoing haemodialysis are repeatedly exposed to stress and pain from approximately 300 punctures per year to their AVF. In September 2008, the world health organization (WHO) estimated that nearly 80% of the population in the world has either insufficient or no access to moderate or severe pain treatment. Every year millions of people around the world suffer from pain without sufficient treatment. Patients undergoing HD are repeatedly exposed to pain due to insertion of large gauge needle into the fistula.[6] Pain is unpleasant sensory and emotional experience associated with actual or potential damage of tissue with physiological or psychological responses[1].When pain was surveyed, it was found that 90% of adult expressed pain because of needle based procedure. Pain inflicted by insertion of large cannulae into AVF on regular HD is a significant cause of concern for both children and adult patients. Although AVF puncturing causes pain, local anesthesia is not frequently used due to concerns of vasoconstriction, burning sensation, scarring and infection.[7,8] Ricci and kyle listed strategies for pain management to include pharmacological and non pharmacological intervention. The non pharmacological approaches are essential component of pain relieve that include relaxation technique, visual imagery, behavioral-cognitive strategies and biophysical interventions such as massage, pressure, and cutaneous electrical nerve stimulation through either heat or cold application.[9] Although most of nurses have a commitment in pain reduction, fewer of them work for alleviation. Effort on pain management from health professionals at all department levels should be implemented as an important measure toward changing ineffective pain management practices. Cutaneous stimulation is defined as stimulation of the skin and underlying tissues for the purpose of decreasing undesirable signs and symptoms such as pain, muscle spasm or inflammation. It also referred to as peripheral technique; describe any form of stimulation of the skin with the goal of pain relief. There are many different methods of cutaneous stimulation such as pressure, massage, heat, and/ or cold application.[10] Research evidence show that cutaneous stimulation is an independent nursing intervention that advocated relieving pain and the nurse in practice is qualified to give it accurately .The cutaneous stimulation is best explained by the gate control theory in minimizing pain. It can be clubbed with acupressure to the large intestine energy meridian to increase its effectiveness.[11,12] The large intestine energy meridian pathway is bilateral and begins in the surface of skin at the root of the index fingernail. It crosses through the arm and hand then the outward end of shoulder blade. After that the meridian leaves the skin surface to connect with the lower part of the lung and transverse colon. It then returns to the skin surface at a point under the chin. It follows the lower row of dental roots passing them to the upper line of the teeth roots crossing the front of the mouth to emerge on the skin surface and facial point next to the nostrils.[4] The large intestine meridian is an acupressure point located on the back side of the hand between the thumb and index finger which is used dominantly to relive pain of shoulder, arm, rigidity of the neck and scapula and eye disease. The most effective site of cutaneous stimulation is contralateral to the pain.[11,12] Studies have also thrown light on the fact that cold therapy (cryotherapy) is one of the effective cutaneous stimulation techniques in alleviating pain. Cryotherapy is defined as the use of a substance that applied to the body to decrease tissue temperature.[13] It was clarified that cryotherapy is used for treatment of pain by slowing nerve conduction rate and blocking nerve impulses through lowering the temperature over the affected area. It also relaxes muscles, decrease capillary permeability by vasoconstriction and slow cellular metabolism. It can be applied topically, percutanously or surgically. The cold application can be delivered by cold packs, ice massage or spray.[14]The nurse have important role in providing right patient care by helping and teaching patient how to apply cryotherapy. The nurse also should work with the patient during the application starting from preparation, application with continuous observation for the patients' tolerance to the procedure. Moreover she should teach patient the self application of cryotherapy.[15]The study was undertaken to examine the effect of cutaneous stimulation on pain relieving at arteriovenous fistula puncture site among Hemodialysis patients.Cryotherapy literally means cold therapy. The

pain-relieving benefits of snow and ice were first written by the greek physician Hippocrates thousands of years ago. When pressing a bag of frozen, it is treating the pain with a modern version of cryotherapy.

MATERIALS AND METHODS

Research Design

Quasi experimental design was chosen for the study.

Variables

Independent variable: cryotherapy.
Dependent Variable: pain score among haemodialysis patients with AV Fistula.

Setting of the Study

The study was conducted at Saveetha medical college and hospital, Thandalam which is a 1200 bedded hospital. The dialysis department is highly equipped and organized. It is staffed by specially trained Nephrologists, Staff nurses and dialysis technician.

Population

All Haemodialysis patients were considered as a population for the study.

Target Population

All the patients on Haemodialysis with AV fistula in nephrology department.

Accessible Population

All the patients on haemodialysis with AV fistula in nephrology department at SMCH.

Sample

Patients on Haemodialysis with AV fistula who fulfilled the inclusion criteria and attended Haemodialysis in nephrology department at SMCH.

Sample Size

30 patients in experimental group and 30 patients in control group was assigned.

Sampling Technique

Haemodialysis patients who fulfilled the inclusion criteria during intervention was selected as a sample for the study by using convenient sampling technique.

Inclusion Criteria

Patients who have AV- fistula in hand and undergoing Haemodialysis., Both male and female patients above 20 years of age.

Exclusion Criteria

Patients with neurological disorders who is not able to perceive pain, Patients who are receiving analgesics, Patients who have injuries and redness in hands, Patients who are critically ill and not able to comprehend, Patients who have Raynauld' syndrome and allergic to cold, Pilot study samples.

Intervention

Cold application was done with the ice cubes wrapped in gloves on the web between the thumb and index finger of the hand not having the AV fistula (contralateral arm). The procedure was started 5 minutes before the venipuncture and it was continued throughout the puncturing procedure the researcher himself perform the ice massage, while another staff member done the AV fistula cannulation.

Ethical Clearance

The research proposal was approved by the scientific review board and it was reviewed by institutional human ethical committee recommended by Saveetha University.

Data Collection Procedure

The main study was conducted at Saveetha Medical College and Hospital, Chennai, after obtaining formal permission from the Principal, Scientific Review Board and Institutional Human Ethical Committee of Saveetha University and the HOD of Nephrology in SMCH. A total of 60 samples who met the inclusion criteria were selected by convenient sampling technique for the study, 30 in experimental group and 30 in control group was assigned. II & III Shift samples were taken for experimental group and I & IV Shifts samples were taken for control group. After selecting sample for the study, Researcher introduced himself and explained the purpose of the study to the patients. Informed consent was obtained after assuring confidence. Demographic variable was collected by using structured questionaire then the pre test level of pain during AV fistula puncture site was assessed by numerical pain rating scale for both groups.The second day the experimental group patients was given cold application between the thumb and index finger of the hand not having AV fistula for 5minitues and the control group patients was continue the routine treatment. After that, post test level of pain was assessed by using numerical pain rating scale for both experimental and control group Data were analyzed using descriptive and inferential statistics.

Table 1

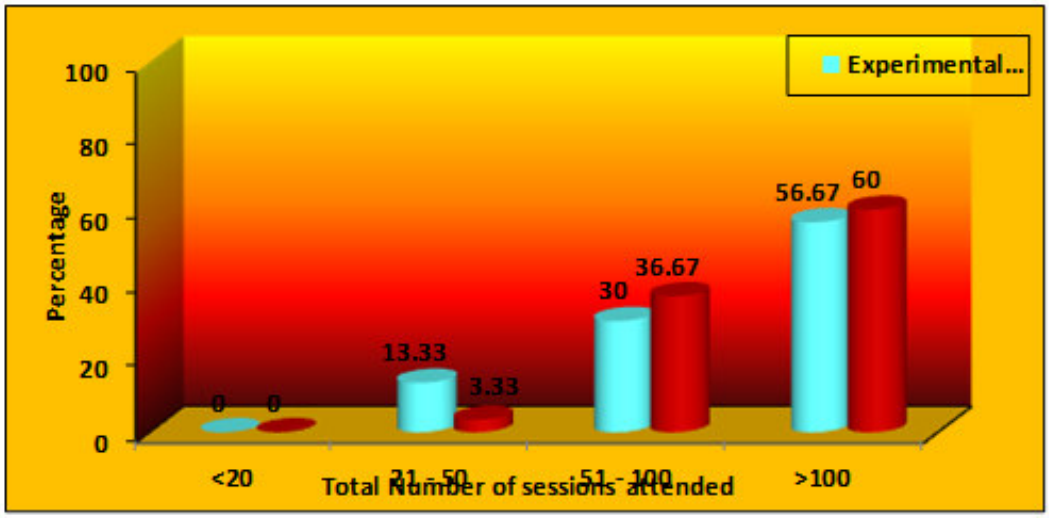
Frequency and percentage distribution of demographic variables of patients on haemodialysis in experimental and control group.

Demographic Variables	Experimental Group		Control Group	
	No.	%	No.	%
Age in years				
30 – 40	1	3.33	3	10.00
41 – 50	9	30.00	6	20.00
51 – 60	9	30.00	12	40.00
61 and above	11	36.67	9	30.00
Sex				
Male	26	86.67	23	76.67
Female	4	13.33	7	23.33
Frequency of attending dialysis in a week				

Daily	0	0.00	0	0.00
Once	0	0.00	0	0.00
Twice	12	40.00	13	43.33
Thrice	18	60.00	17	56.66
Other pain relieving measures				
Local anaesthesia	4	13.33	6	20.00
Topical anaesthesia	5	16.67	4	13.33
Button hole cannulation	0	0.00	0	0.00
Technician expertise	21	70.00	20	66.67

n = 60 (30+30)

The table 1 reveals that in the age group of 30 – 40 years, the participants in experimental group were, 1(3.33%) whereas in the control group 3(10.00%), in the age group of 41 – 50 years, in the experimental group were 9(30.00%) whereas in the control group 6(20.00%), in the age group of 51 – 60 years, in the experimental group were 9(30.00%) whereas in the control group 12(40.00%), majority of the patients 11(36.37%) were in the age group of 61 and above in the experimental group, whereas in control group 9(30.00%). Regarding sex, in the experimental group 26(86.67%) were males and 4(13.33%) were females, whereas in control group 23(76.67%) were males and 7(23.33%) were females. Regarding Frequency of attending dialysisin a week in the experimental group 12(40.00%) whereas in control group 13(43.33%) were attending twice in a week and frequency of attending dialysis thrice in experimental group were 18(60.00%), whereas in control group 17(56.66%). Regarding other pain relieving measures, in the experimental group were 4(13.33%) whereas in control group 6(20.00%) Said local anaesthesia, in the experimental group were 5(16.67%) whereas in control group 4(13.33%) said topical anaesthesia, in experimental group were 21(70.00%) whereas in control group 20(66.67%) said Technician expertise.



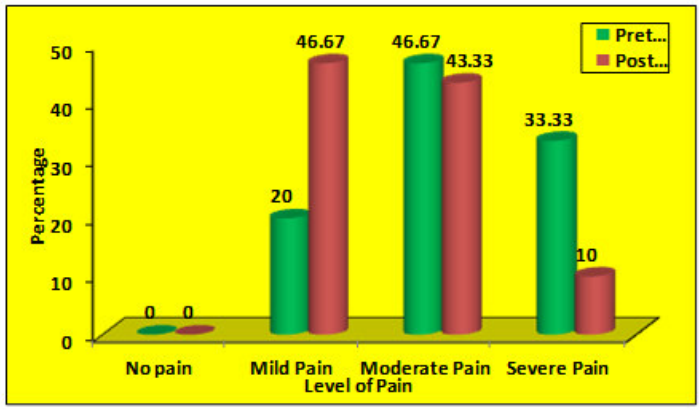
The above figure showed that in the experimental group 21 – 50 numbers of dialysis session attend were 4(13.33%) whereas in control group 1(3.33%), 51 -100 numbers of dialysis session attend were 9(30.00%)in experimental group and 11(36.67%)whereas in control group, >100 numbers of dialysis session attend has 17(56.67%) were in experimental group, 18(60.00%) whereas in control group.

Figure 1
Percentage distribution of total number of dialysis sessions attended by the patients on haemodialysis.

Table 2
Frequency and percentage distribution of pretest and post test level of pain during arterio venous fistula puncture site among patients on haemodialysis in the experimental group

P	No pain		Mild Pain		Moderate		Severe		Mean	S.D
ain	No.	%	No.	%	No.	%	No.	%		
Pretest	0	0	6	20.0	14	46.67	10	33.33	5.70	2.07
Post Test	0	0	14	46.67	13	43.33	3	10.0	3.90	1.84

n = 30 The table 2 shows that 6(20.00%) has mild level of pain in the pre test and 14(46.67%) in the post test, and majority 14(46.67%) had moderate level of pain in the pre test and 13(43.33%) in the post test, 10(33.33%) had severe level of pain in the pretest and 3(10.0%) in the post test in experimental group.



The above figure showed that 6(20.00%) has mild level of pain in the pretest and 14(46.67%) in the post test, and majority 14(46.67%) had moderate level of pain in the pretest and 13(43.33%) in the post test, 10(33.33%) had severe level of pain in the pretest and 3(10.0%) in the post test in experimental group.

Figure 2

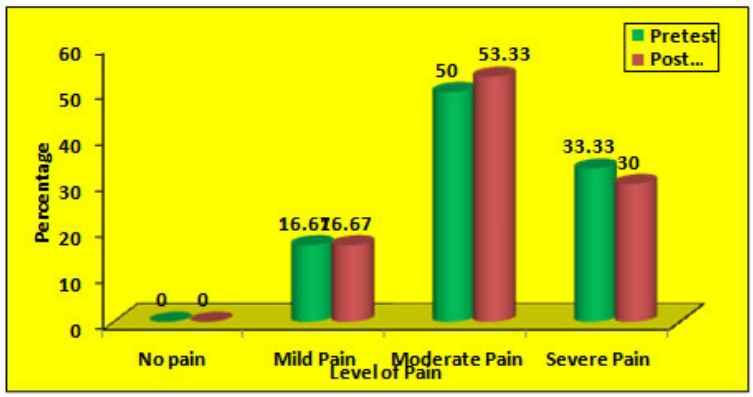
Percentage distribution of pretest and post test level of pain during arterio venous fistula puncture site among patients on haemodialysis in the experimental group.

Table 3

Frequency and percentage distribution of pretest and post test level of pain during arterio venous fistula puncture site among patients on haemodialysis in the control group

Pain	No pain		Mild Pain		Moderate		Severe		Mean	S.D
	No.	%	No.	%	No.	%	No.	%		
Pretest	0	0	5	16.67	15	50.0	10	33.33	5.53	1.88
Post Test	0	0	5	16.67	16	53.33	9	30.0	5.63	1.60

n = 30 The table 3 shows that 5(16.67%) has mild level of pain in the pre test and 5(16.67%) in the post test, majority 15(50.0%) had moderate level of pain in the pre test and 16(53.33%) in the post test, and 10(33.33%) had severe level of pain in the pretest and 9(30.0%) in the post test in control group.



The above figure showed that 5(16.67%) has mild level of pain in the pre test and 5(16.67%) in the post test, majority 15(50.0%) had moderate level of pain in the pre test and 16(53.33%) in the post test, and 10(33.33%) had severe level of pain in the pretest and 9(30.0%) in the post test in control group.

Figure 3

Percentage distribution of pretest and post test level of pain during arterio venous fistula puncture site among patients on haemodialysis in the control group.

Table 4

Effectiveness of cryotherapy on Arterio Venous Fistula puncture site among patients on Haemodialysis in experimental group.

EXPERIMENTAL GROUP						Paired t test P value
Pre test		Post test		Effective score		
Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	
5.70	2.07	3.90	1.84	1.8	0.27	10.662*** P=0.001, S

**** p<0.001, S – significant, N.S – Not Significant*

The above table 4 reveals that the pretest mean score of pain in the experimental group was 5.70±2.07 and the post test mean score of pain was 3.90±1.84. The mean pain score in the experimental group 5.70 was decreased to 3.90 after the administration of cryotherapy which indicates that cryotherapy was found to be effective in reducing the pain during arterio venous fistula puncture site among patients on haemodialysis in the experimental group.

Table 5
Effectiveness of cryotherapy on Arterio Venous Fistula puncture site among patients on Haemodialysis between experimental group and control group.

	Test	Experimental Group		Control Group		Unpaired 't' value
		Mean	S.D	Mean	S.D	
Level of Pain	Pretest	5.70	2.07	5.53	1.88	0.326 P=0.746, N.S
	Post test	3.90	1.84	5.63	1.60	**3.880 P=0.001,S*** **

n = 60(30+30) *** p<0.001, S – significant, N.S – Not Significant

The above table 5 reveals that the pretest mean score of pain in the experimental group was 5.70±2.07 and the pretest mean score of pain in the control group was 5.53±1.88. The calculated unpaired't' value of t = 0.326 was not found to be statistically significant which clearly indicates that there was no difference in the level of pain between the experimental and control group. Whereas the post test mean score of pain in the experimental group was 3.90±1.84 and the post test mean score of pain in the control group was 5.63±1.60. The calculated unpaired't' value of t = 3.880 was found to be statistically significant at p<0.001 level. This clearly indicates that after the administration of cryotherapy there was a decrease in the level of pain among patients in the experimental group than the patients in the control group who had undergone normal hospital routine measures.

Table 6
Association of post test level of pain during arterio venous fistula puncture site among patients on haemodialysis with their selected demographic variables in the experimental group.

Demographic Variables	Mild Pain		Moderate		Severe		Chi-Square Value
	No.	%	No.	%	No.	%	
Total number of dialysis sessions attend							χ^2=10.922 d.f=4 p = 9.49 S*
<20	-	-	-	-	-	-	
21 – 50	1	3.3	3	10.0	0	0	
51 – 100	2	6.7	4	13.3	3	10.0	
>100	11	36.7	6	20.0	0	0	

n = 30 **p<0.01, S – Significant

The table 6 show that 21 – 50 numbers of dialysis session attend were 1(3.3%) has mild level of pain, 3(10.0%) has moderate level of pain, whereas 51 – 100 numbers 2(6.7%) has mild level of pain, 4(13.3%) has moderate pain, 3(10.0%) has severe pain and > 100 numbers were 11(36.7%) has mild level of pain, 6(20.0%) has moderate level of pain and the dialysis session attended had shown statistically significant association with post test level of pain among patients on haemodialysis at p<0.05 level in the experimental group.

DISCUSSION

The aim of the study was to assess the effectiveness of cryotherapy on pain relieving arterio venous fistula puncture site among patients on haemodialysis in experimental and control group. The first objective was to assess the level of pain during Arterio Venous Fistula puncture site among patients on haemodialysis in experimental group and control group. The findings of the present study reveals that majority 14(46.67%) had mild level of pain, 13(43.33%) had moderate level of pain and 3(10%) had severe level of pain during arterio venous fistula puncture site among patients in the experimental group. And in the control group the findings shows that majority 16(53.33%) had moderate level of pain, 9(30.0%) had severe level of pain and 5(16.67%) had mild level of pain during arterio venous fistula puncture site. The findings of the present study were supported by Befa Noto Kadou Kaza1, Kossi Akomola Sabi Among 92 hemodialysis patients include in study, there was a parity of sex the mean age was 43.76±13.6 years. Prevailed nephropathy etiology was glomerulonephritis with 32.6 %. The duration of hemodialysis was of 156.99±74.3 months. There were 93.5 % native AVF. Distal AVF was dominant in 78.3 %. Duration of the AVF was of 103±70.3 months. Prevalence of the pain due to AVF puncture was 60.9 %. The mean of intensity was 2.53±2.6 with an ascendancy of the shape moderated (62 %). Only 3.6 % of patients who felt pain used the anesthetic cream (cream EMLA: Eutetic mixture of lidocaine and prilocaine in emulsion) before puncture with100 % efficiency. No other analgesic preventive method was practiced. Among the group of the patients without pain, nobody used the anesthetic cream. No other analgesic method was practiced. In univariate analysis, the proximal situation of the AVF (p=0.020) and the apprehension before the puncture (p=0.037) were

significantly associated with the arisen of the pain during AVF. This was supported by Asmaa H. Abd El- Hay (2014) Egypt. A random sample of forty haemodialysis patients in Shebein El- hospital and twelve patients in menoufia university hospital who had AV fistula was divided. Tool I an interviewing questionnaire to assess sociodemographic and medical data, Tool II Abbey pain scale to assess objective pain behaviour and Tool III numerical pain scale to assess subjective pain was used. After application of cryotherapy majority of sample had mild objective pain during second visit and no pain during third visit and also the subjective pain among the studied sample was either moderate or severe before applying cutaneous stimulation, while after application majority of them had mild pain in second visit and no pain on third visit. So that cutaneous stimulation is effective in reducing AV fistula puncture objective and subjective pain scores among haemodialysis patients. As a conclusion, there is a need for new easiest, effective and economic method to reduce the level of pain during Arterio venous fistula puncture pain. The second objective was to assess the effectiveness of cryotherapy on Arterio Venous Fistula puncture site in experimental group among patients on Haemodialysis The findings of the present study reveals that the pretest mean score of pain in the experimental group was 5.70±2.07 and the post test mean score of pain was 3.90±1.84. The mean pain score in the experimental group 5.70 was decreased to 3.90 after the administration of cryotherapy which indicates that cryotherapy was found to be effective in reducing the pain during arterio venous fistula puncture site among patients on haemodialysis in the experimental group. The findings of the present study were supported by Sabitha P.B., Mahajan et al. A randomized control trail design was used and the tools used were a demographic data, and a numerical pain intensity scale. Chi square, two-sample and paires t-test, the man whitney test, Wilcoxon's signed rank test, the Kruskal Wallis test, and Spearman's and pearson's correlations were used for inferential statistics. The objective and subjective pain scores were significantly (P=0.001) reduced within the treatment group with the application of cryotherapy. Thus, cryotherapy was found to be an effective pain management technique in these patients. The finding of the study was supported by Lijiya jose, Lobo Diana (2015) Mangalore**.** Conduct a Quasi experimental time series design. There was a significant difference between the pre-test and post-test behavioral response scores and pain scores in the experimental group p<0.05). The mean post-test behavioral response scores of the experimental group (3.2±1.05, 2.8±1.11) was lower than the mean post-test behavioral response scores of the control group (4.6±1.22, 4.5±0.86) in the post-test 1, 2 respectively. The calculated't' values (t1=4.21, t2=6.21) were more than the table value (t48=1.96) at 0.05 level of significance. The mean post-test pain scores of the experimental group (3.3±1.37, 2.8±1.09) were lower than the mean post-test pain scores of the control group (4.32±0.9, 4.56±1) in the post-test 1, 2 respectively. The calculated't' values (t1=3.04, t2=5.66) were more than the table value (t48=1.96) at 0.05 level of significance. As a conclusion, pain is a common problem and if not treated, can have a significant effect on a patient's quality of life. Through proper education, assessment, prevention, referral and appropriate treatment, patients with nurses' help, can minimize pain and its effect. The third objective was to associate the selected demographic variables with level of pain in post test in experimental group. The findings of the study shows that the demographic variable total number of dialysis session attended had shown statistically significant association with post test level of pain among patients on haemodialysis at p<0.05 level. The other demographic variables had not shown statistically significant association with post test level of pain among patients on haemodialysis in the experimental group.

Summary

The study was conducted in Saveetha Medical College and Hospital, after obtaining formal permission from the Principal, Scientific Review Board and Institutional Human Ethical Committee. A total of 60 samples were selected by convenient sampling technique for the study,30 in experimental group and 30 in control group. II & III Shift samples were taken for experimental group and I & IV Shifts samples were taken for control group. After selecting sample for the study, Informed consent was obtained after assuring confidence. Demographic variable was collected by using structured questionaire then the pre test level of pain during AV fistula puncture site was assessed by numerical pain rating scale for both groups.The second day the experimental group patients was given cold application between the thumb and index finger of the hand not having AV fistula for 5minitues and the control group patients was continue the routine treatment.After that, post test level of pain was assessed by using numerical pain rating scale for both experimental and control group Data were analyzed using descriptive and inferential statistics.

Major findings of the study

1. In experimental group, majority 14(46.67%) had moderate level of pain, 10(33.33%) had severe level of pain and 6(20%) had mild level of pain. In control groupmajority 15(50%) had moderate level of pain, 10(33.33%) had severe level of pain and 5(16.67%) had mild level of pain in pre test.
2. In experimental group majority 14(46.67%) had mild level of pain, 13(43.33%) had moderate level of pain and only 3(10%) had severe level of pain. In control group, majority 16(53.33%) had moderate level of pain, 9(30%) had severe level of pain and 5(16.67%) had mild level of pain. in post test.
3. Cryotherapy was found to be effective in reducing the pain during arterio venous fistula puncture site among patients on haemodialysis. It was statistically significant at P < 0.001.
4. Total number of dialysis session attended had shown statistically significant and the other demographic variables had not shown statistically significant association with post test level of pain among patients on haemodialysis in the experimental group at p<0.05 level.

CONCLUSION

This study indicates that cryotherapy is a simple non-pharmacological and cost effective method. It is

effective in reducing pain among Haemodialysis patients with AV Fistula puncture site pain which is denoted by significant reduction in level of pain. The selected patients became familiar and found themselves comfortable and also expressed satisfaction. From the results of the study, it is concluded that cryotherapy is not only cost effective but also easy to apply.

CONFLICT OF INTEREST

Conflict of interest declare none.

REFERENCE

1. Fareed AP, El-Hay AH, El-Shikh AA. Cutaneous stimulation: its effect on pain relieving among hemodialysis patients. children. 2014 Jan 29;5(1).
2. Sabitha PB, Khakha DC, Mahajan S, Gupta S, Agarwal M, Yadav SL. Effect of cryotherapy on arteriovenous fistula puncture-related pain in hemodialysis patients. Indian journal of nephrology. 2008 Oct 1;18(4):155..
3. Monhan F. Medical Surgical Nursing, 3rd. ed. WB Saunders Company, Toronto. M.2004. (1394-408).
4. Fareed AP, El-Hay AH, El-Shikh AA. Cutaneous stimulation: its effect on pain relieving among hemodialysis patients. children. 2014 Jan 29;5(1).
5. Bojakowski K, Andziak P. Forearm radiocephalic fistula for dialysis. Acta Angiol. 2011 Jun 1;17(2):117-40.
6. Çelik G, Ozbek O, Yilmaz M, Duman I, Ozbek S, Apiliogullari S. Vapocoolant spray vs lidocaine/prilocaine cream for reducing the pain of venipuncture in hemodialysis patients: a randomized, placebo-controlled, crossover study. Int J Med Sci. 2011 Jan 1;8(7):623-7.
7. Montero RC, Arellano FR, Abad MD, Gómez AM, Galán MI. PAIN DEGREE AND SKIN DAMAGE. DURING ARTERIO-VENOUS FISTULA PUNCTURE. EDTNA-ERCA Journal. 2004 Oct 12;30(4):208-12..
8. Ball LK. Improving arteriovenous fistula cannulation skills. Nephrology Nursing Journal. 2005 Nov 1;32(6):611.
9. Ricci SS, Kyle T. Maternity and pediatric nursing. Lippincott Williams & Wilkins; 2009.
10. Figueiredo AE, Viegas A, Monteiro M, Poli-de-Figueiredo CE. Research into pain perception with arteriovenous fistula (avf) cannulation. Journal of renal care. 2008 Dec 1;34(4):169-72.
11. Bauer M. The final days of traditional beliefs?—part one. Chinese Medicine Times. 2006;1(4).
12. Waters BL, Raisler J. Ice massage for the reduction of labor pain. Journal of midwifery & women's health. 2003 Sep 10;48(5):317-21.
13. Silva SA, Oliveira DJ, Jaques MJ, Araújo RC. Efeito da crioterapia e termoterapia associados ao alongamento estático na flexibilidade dos músculos isquiotibiais. Motricidade. 2010 Dec;6(4):55-62.
14. Hughes J. Pain management: from basics to clinical practice. Elsevier Health Sciences; 2008.
15. Fareed AP, El-Hay AH, El-Shikh AA. Cutaneous stimulation: its effect on pain relieving among hemodialysis patients. children. 2014 Jan 29;5(1).

Reviewers of this article

Dr. M.A. Shabanathul Missiriya

Professor Cum Community Health ,Saveetha college of Nursing , Saveetha University , Tamilnadu, India.

G. Bakhya Shree M.S. (Research)

Coordinator and Trainer, Department of Biotechnology and Life Sciences, Dexter Academy, Madurai, Tamilnadu

Prof.Dr.K.Suriaprabha

Asst. Editor , International Journal of Pharma and Bio sciences.

Prof.P.Muthuprasanna

Managing Editor , International Journal of Pharma and Bio sciences.

We sincerely thank the above reviewers for peer reviewing the manuscript