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RESEARCH ARTICLE

A STUDY TO ASSESS THE EFFECTIVENESS OF CRYOTHERAPY ON PAIN DURING PUNCTURE OF ARTERIOVENOUS FISTULA AMONG THE PATIENTS ON HAEMODIALYSIS IN SELECTED HOSPITALS

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ABSTRACT

Pain during AV fistula puncture is a common problem in patients undergoes haemodilaysis. Cutaneous stimulation is an independent nursing intervention that advocated relieving pain and the nursing practice is qualified to give it accurately. Cryotherapy is a form of therapy consisting in the local or general use of cold. The study concluded that the cryotherapy is an effective intervention to reduce pain during puncture of arteriovenous fistula among patients of haemodialysis.

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INTRODUCTION

Kidney is a major organ of our body, which are retroperitoneal organ produce and secrete hormones and enzymes that help to regulate red blood cell production, blood pressure, and calcium and phosphate metabolism. All patients diagnosed as end stage renal disease needed renal replacement therapy. In developing countries such as India, the management of end-stage renal disease is largely guided by economic considerations. Haemodialysis is mainly a short-term measure to support ESRD patients prior to transplant. Haemodialysis is not possible without vascular access. In case of patient undergoing maintenance haemodialysis needed permanent vascular access, no vascular access has exceeded the success and reliability of arteriovenous Fistula (AVF). Fistulas have the best overall patency rates and least number of complications (e.g., thrombosis, infections) of all vascular accesses. To draw the blood from fistula AVF needles are used. The needles used are 14 to 16 gauges and are inserted into the fistula or graft to obtain vascular access. One needle is placed to pull blood from the circulation to the haemodialysis machine, and the other needle is used to return the dialyzed blood to the patient. The needles are attached via tubing to dialysis lines. The insertion of large bore needle in to arteriovenous fistula causes significant pain.

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MATERIALS AND METHODS

The research approach adopted for this study was evaluative approach and post-test only control group research design. The sample composed of 60 subjects (30 in Experimental and 30 in Control group) undergoing haemodialysis having arteriovenous fistula. The sampling technique used in the study was Probability simple random sampling technique. The researcher used 9 item for demographic data which include age, gender, education, religion, occupation, type of family, activity that makes your pain worse, duration of haemodialysis, duration of AV fistula. Numerical rating scale for pain assessment and Modified objective behavioural tool which include 5 items like facial expression, vocalization, body movement, interpersonal behaviour and bio physiological measure. In this study Inter rater method was used to find out the reliability of the tool. The reliability of the tool was calculated 0.871 for numerical rating scale and 0.874 for modified objective behavioural assessment tool by Kappa method. The data was collected and analyzed with descriptive and inferential statistics.

RESULTS

Major findings of the study

I. Findings related to demographic data of the participation

The findings of the effectiveness of cryotherapy through the pain scoring by numerical pain rating scale in experimental group 14 (46.6%) subjects were having mild pain by numerical rating scale, followed by 13 (43.3%) subjects were having moderate pain and 3(10%) subjects having severe pain.

In control group 23(76.6%) subjects were having severe pain, followed by 4(13.3%) subjects were having moderate pain and remaining 3(10%) subjects were having mild pain.

Table I: Distribution of subject's characteristics (personal characteristics) in relation to demographic data n= 60

Parameters		Experiment	%	Control	%
Age (Yrs.)	20 – 40	4	13.3	9	30
	41 – 60	21	70	15	50
	61 – 75	5	16.6	6	20
Gender	Male	18	60	22	73.3
	Female	12	40	8	26.6
Education	Illiterate	0	0	1	3.3
	Primary	6	20	10	33.3
	Higher	7	23.3	7	23.3
	secondary	17	56.6	12	40
	Graduate & above				
Religion	Hindu	21	70	24	80
	Muslim	6	20	4	13.3
	Others	3	10	2	6.6
Occupation	Student	0	0	3	10
	Private service	5	16.6	2	6.6
	Govt. service	5	16.6	2	6.6
	Self employed	4	13.3	5	16.6
	Unemployed	1	3.3	3	10
	Home maker	10	33.3	8	26.6
	other	5	16.6	7	23.3
Type of family	Joint	16	53.3	17	56.6
	Nuclear	14	46.6	13	43.3
What activity makes your pain worse	Uncomfortable position	13	43.3	14	46.6
	Injury at site	3	10	3	10
	Hand movement	14	46.6	13	43.3
Duration of haemodilyasis	Once a week	1	3.3	1	3.3
	Twice a week	18	60	13	43.3
	Thrice a week	11	36.6	16	53.3
Duration of AV Fistula (Yrs)	0 – 2	14	46.6	10	33.3
	3 – 5	12	40	11	36.6
	6 – 8	4	13.3	6	20
	9 & above	0	0	3	10

II. Findings related to effectiveness of Cryotherapy through the pain scoring by numerical pain rating scale

Table II. Comparison of pain score by numerical rating scale in experiment and control group

Numerical rating scale	Experiment (n=30)		Control (n=30)		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Pain score	4.07	1.46	7	1.74	5.22	<0.0001

III. Findings related to effectiveness of cryotherapy through the pain scoring by using modified objective behaviour assessment tool

The pain assessment score by modified objective behaviour assessment tool where in experimental group 24(80%) subjects were having mild pain, followed by 5 (16.6%) subjects were having moderate pain and remaining 1(3.3%) subjects were having severe pain. In control group 14(46.6%) subjects were having moderate pain, followed by 12(40%) subjects were having severe pain and remaining 4 (13.3%) subjects were having mild pain.

Table III : Comparison of Pain assessment score by modified objective behavior assessment tool in experiment and control group

Behavior assessment tool	Experiment (n=30)		Control (n=30)		MW test Z Value	P Value
	Mean	SD	Mean	SD		
Pain score	2.30	1.78	5.60	1.92	5.19	<0.0001

IV. Findings related to the correlation between levels of pain with selected demographic variables

The findings of the study show that there is no significant difference between level of pain with selected demographic variables.

DISCUSSION

In the present study the sample taken were 60 were 30 in experimental group and 30 in control group. Cryotherapy was given 10minute before the puncture and continued 2minutes after puncture. The pain score was assessed by numerical pain rating scale and modified behavioural tool shows the result that. The mean pain score by numerical rating scale in the experimental group was 4.07 + 1.46 and that of control group was 7 + 1.74 which is significant as p< 0.0001. The mean pain score by modified behavioural tool in experimental group was 2.30 + 1.78 and that of control group 5.60 + 1.92, which is significant as p value < 0.0001. So the study is concluded that cryotherapyis effective on pain during puncture of arteriovenous fistula among patients on haemodialysis. There is significant difference in the pain score by modified behaviour assessment tool in experimental and control group since the 'P' value is < 0.00001. This shows that cryotherapy was effective on pain during puncture of arteriovenous fistula among patients on haemodialysis. Abbas Heydari *et al*. (2012), conducted a study to assess the effect of oral cryotherapy on the incidence and severity of chemotherapy-induced oral mucositis in combined chemotherapy regimens. Methods: This was a randomized controlled trial that enrolled 80 cancer patients. We evaluated the primary oral status of all patients prior to chemotherapy. Patients were divided into two groups, experimental and control. The experimental group was given ice to place in their mouths from 5 min before to 5 min after chemotherapy. The control group received no intervention. Both groups were treated with the following chemotherapy regimens: i) 5- fluorouracil + leucovorin; ii) cyclophosphamide + adriamycin + 5-fluorouracil; or iii) cyclophosphamide + methotrexate + fluorouracil. World Health Organization and patient-based oral mucositis scales were used for evaluation.shows the result that the incidence of oral mucositis

in the intervention group (45%) was significantly lower than the control group (77.5%; P=0.01). The incidence of oral mucositis in the intervention group based on the Patient-Judged Oral Mucositis Scale was lower than the control group. The findings of this study indicated that patients who underwent cryotherapy had less severe oral mucositis based on both WHO (P=0.01) and patient oral mucositis scales (P=0.001). So the study is concluded that oral cryotherapy because of its ease of application, tolerability and lack ofside effects makes it an important resource for reducing the incidence and severity of oral mucositis.

Conclusion

The following interpretation can be done from the findings of the study. The analysis of the data reveals that the cryotherapy is highly significant in experimental group for reduction of pain during puncture of arteriovenous fistula among the patients on haemodialysis than control group as measured through modified behavior assessment tool and numerical pan rating scale.

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