



ORIGINAL RESEARCH PAPER

Nursing

EFFECTIVENESS OF CUTANEOUS STIMULATION ON AV FISTULA PUNCTURE RELATED PAIN AMONG PATIENTS UNDERGOING HEMODIALYSIS IN A SELECTED HOSPITAL OF GUWAHATI, ASSAM.

KEY WORDS: Effectiveness, cutaneous stimulation, AV fistula, puncture related pain

Wegara R Marak	SankarMadhab College of Nursing, assam down town University
Prof (Mrs) Manashi Sengupta *	Dean In charge, Faculty of Nursing, assam down town University, Gandhinagar, Panikhaiti Guwahtai Assam *Corresponding Author
Bethbhalin Mary Mukhim	Lecturer, Sankar Madhab College of Nursing, Panikhaiti, Guwahati Assam

ABSTRACT Arteriovenous (AV) fistula is punctured for accessing the blood stream for hemodialysis, which is a very painful procedure. A post-test-only control group study was undertaken among patients undergoing hemodialysis in down town Hospital, Guwahati, Assam, India. Sixty eligible patients were randomly assigned. The experimental group (n=30) received cutaneous stimulation for 10 minutes before venipuncture, whereas the control group (n=30) received no intervention. Subjective pain after AV fistula puncture was scored using a numerical pain rating scale of 0-10. The mean pain score (4.3) of the control group was higher than the mean pain score (2.9) in the experimental group. The t-value for mean pain score (2.83) was found to be greater than the tabulated value (2.00) at $p < 0.05$. The pain score among patients in the control group was found to be associated with selected demographic variable viz. sex. Cutaneous stimulation is a simple, non-invasive technique of pain management

INTRODUCTION

Pain is an unpleasant feeling and it is called as the fifth vital sign.¹ 10% of the population worldwide is affected by chronic kidney disease (CKD) and in India more than 1 million cases are reported per year. Over 2 million people worldwide currently receive treatment with dialysis and undergoes 10 AV fistula punctures a month and approximately 300 punctures per year and would continue to do so throughout their lifetime.² Repeated AVF punctures lead to a considerable degree of pain, due to the caliber and length of the bevel of fistula needles.³ Silva O, Rigon E, Dalazen J et al. conducted a cross-sectional study to evaluate the intensity of pain among 70 individuals in a hemodialysis clinic using visual analogue scale. During cannulation, the pain reported was moderate in 58.5% of patients, intense in 30% and mild in 11.5%.⁴ Non-pharmacological interventions like cutaneous stimulation have been defined in order to reduce the symptoms such as pain, spasm or muscle inflammation. Cold therapy as one of the cutaneous stimulation method is a simple, cheap and effective intervention before the venous cannulation to relieve pain of venipuncture.

Methodology

A post-test-only control group study was undertaken among patients undergoing hemodialysis in downtown Hospital, Guwahati, Assam, India. Sixty eligible subjects were randomly assigned to control and experimental groups using simple random sampling through lottery method. The experimental group (n=30) received cutaneous stimulation for 10 minutes before venipuncture, whereas the control group (n=30) received no intervention for pain management. Subjective pain immediately after AV fistula puncture were scored using a numerical pain rating scale of 0-10.

Criteria for sample selection

Inclusion Criteria

1. Patients undergoing hemodialysis due to chronic kidney disease (CKD)
2. Patients undergoing hemodialysis via AV fistula in a hemodialysis unit
3. Patients in the age group between 30 to 70 years.
4. Conscious, oriented patients not on sedation

Exclusion Criteria

1. Patients who were unconscious or disoriented.
2. Patients who require more than one attempt for fistula

- puncturing.
3. Patient on pain killers

Variables

Independent variable: cutaneous stimulation
Dependent variable: AV fistula puncture

Method of data collection

The tools used for data collection were a structured interview schedule regarding demographic characteristics among hemodialysis patients, structured interview schedule on patient clinical profile regarding hemodialysis and a numeric pain rating scale. Experts had establish content validity of the tools.

Data Collection Procedure

Prior to the data collection the researcher obtained Ethical Clearance Certificate from the Ethical Clearance Committee of Assam Downtown University, Guwahati, Assam. A prior permission was obtained from the higher authority of Downtown Hospital, Dispur, Assam. The data collection was carried out in the month of December. The samples selection was done based on the inclusion criteria. The data collection was done in the following manner:

- Prior explanation regarding the aim and procedure of the study was provided to the participants.
- Prior consent of the participants was taken before administration of the tools.
- The demographic characteristics and patient clinical profile regarding hemodialysis was collected prior to hemodialysis using Tool I: Structured interview schedule regarding demographic characteristics among hemodialysis patients and Tool II: Structured interview schedule regarding patients clinical profile regarding hemodialysis.
- The experimental group was provided cutaneous stimulation for 10 minutes, using an ice pack measuring 5*6mm at the intended site prior to venipuncture, while the control group did not receive any intervention prior to venipuncture.
- The level of pain was assess immediately after venipuncture using a numerical pain rating scale.

3. Results

The data was organized, tabulated, analyzed and interpreted by using descriptive and inferential statistics based on the objectives of the study. The findings were presented in the following sections.

Section I: Demographic Performa

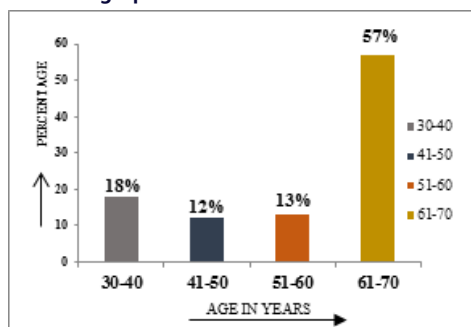


Figure 1: Bar diagram showing percentage distribution of age

Section II: Patient clinical profile

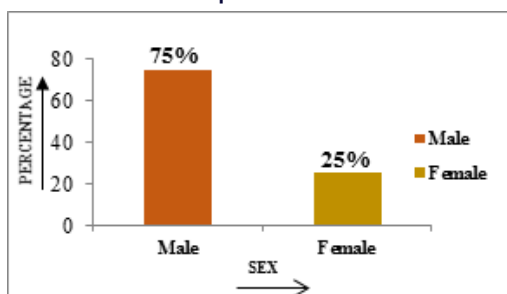


Figure 2: Bar diagram showing percentage distribution of sex.

Table 1: Frequency and percentage distribution regarding patient's clinical profile

Sample Characteristics	n = 60		
	Control group (n=30)	Experimental group (n=30)	Total
1.Site of AV fistula puncture	6	6	12
a.Radio cephalic	24	24	48
b.Brancho cephalic			
2.No. of hemodialysis per week	7	6	13
a.Once per week	9	10	19
b.Twice per week			
c.Thrice per week	14	14	28
3.Size of the needle used	30	30	60
a.16 gauge			

Table 2: Frequency and percentage distribution of pain score in both the control and experimental groups

Pain score	n = 60	
	Control group (n=30)	Experimental group (n=30)
a. No pain (0)	0	3
b. Mild pain (1-3)	13	16
c. Moderate pain (4-6)	12	10
d. Severe pain (7-10)	5	1

Table 3: Comparison of pain scores in control and experimental groups.

Group	n=60				
	Mean	SD	df	"t" value	p value
Control	4.3	1.94	58	2.83	2.00
Experimental	2.9	1.78			

S = Significant* at p<0.05, df (s) = 2.00

Discussion

Worldwide AV fistula is the preferred type of access to the blood

stream for hemodialysis treatment and requires the use of 14-16 gauge needles for venipuncture during which the patients have to experience a lot of pain. The current study was undertaken to assess the effectiveness of cutaneous stimulation in reducing AV fistula puncture related pain. 60 patients receiving hemodialysis were divided into control (n=30) and experimental groups (n=30). The study findings revealed that 3(10%) patients had no pain, 16 (53.3%) had mild pain, 10(33.3%) with moderate pain and 1(3.3%) experiencing severe pain in the experimental group compared to 13 (43.3%) patients experiencing mild pain, 12 (40%) moderate pain, and 5 (16.7%) patients experiencing severe pain in the control group. The results are similar with a study conducted by Dumbre D (2016) to assess the effectiveness of cryotherapy on pain during puncture of arteriovenous fistula among the patients on hemodialysis among 60 patients undergoing hemodialysis. The pain scoring by numerical pain rating scale showed that in experimental group 14 (46.6%) subjects were having mild pain, 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.

CONCLUSIONS

The findings of the study revealed that there was a marked decreased in subjective pain scores (2.9) among patients in the experimental group after receiving cutaneous stimulation prior to venipuncture, compared to the subjective pain score (4.3) among patients in the control group, who did not receive cutaneous stimulation prior to venipuncture with a mean difference of 1.4. There was significant difference between the subjective pain scores of the control and experimental group with a t-value of 2.83 and found to be significant at p<0.05 level. Thus, on the basis of the findings it was concluded that cutaneous stimulation was effective in lowering AV fistula puncture related pain among patients undergoing hemodialysis.

REFERENCES:

- Emanuelson, J., 2012. Needle Phobia Prevalence. Retrieved from: <http://www.needlephobia.com>
- Figueiredo, A., Viegas, A., Monteiro, M., &Poli-De-Figueiredo, E. (2008). Research into pain perception with arteriovenous fistula cannulation. *Journal of Renal Care*, 34(4), 169-72. doi: 10.1111/j.1755-6686.2008.00041
- Kiran, N., Kaur, S., &Marwaha, R. (2013). Effect of ice pack application at the site prior to venipuncture on intensity of pain among children. *Nursing and Midwifery Research Journal*, 9(4), 160-167. Retrieved from: <http://www.medind.nic.in>
- Kaza, B., Sabi, K. A., Amekoudi, E, Imangue, G., Badibanga, J., Tsevi, C., &Wendkuuni, A. (2014). Pain during arterio-venous fistula (AVF) cannulation. *American Journal of Internal Medicine*, 2(5), 87-89. doi: 10.11648/j.ajim.2014.0205.12
- Fareed, M., El-Hay, A., &El-Shikh, A. A. (2014) Cutaneous Stimulation: Its Effect on pain Relieving among Hemodialysis Patients. *Journal of Education and Practice*, 5(1), 9-20. Retrieved from: <http://www.iiste.org>