

## Effect of Cutaneous Stimulation (CS) Versus Routine Management (RM) on Pain and Pain- Related Behaviors (PRB) During Arterio- Venous Fistula Puncture(AVFP) Among Patients Undergoing Hemodialysis in A Selected Hospital in Mangalore



### Nursing

KEYWORDS : Pain; Pain-Related Behaviors; AVFP; Hemodialysis patients; Effect; Cutaneous Stimulation

MRS. ASHAMOL THOMAS

MSc Nursing, Father Muller College Of Nursing, Mangalore

MRS. VICTORIA D' ALMEIDA

Professor, Medical Surgical Nursing, Father Muller College , Of Nursing, Kankanady, Mangalore PIN -575002

MRS JASMINE SARITA VAS

Assistant Professor, Department of Community Health , Nursing, Father Muller College of Nursing, Mangalore. PIN -575002

### ABSTRACT

*Pain inflicted by insertion of large cannula into AVF on regular HD is a significant cause of concern for both children and adult.<sup>1</sup>*

**Material and Methods:** An evaluative approach with Pre- experimental one group post- test only design was used for the study. The sample consisted of 40 hemodialysis patients with arterio-venous fistula who undergo arterio-venous fistula puncture twice a week for hemodialysis, selected using purposive sampling technique. The pain intensity score and pain- related behaviors were assessed during AVF puncture both in routine management and cutaneous stimulation using Numerical Pain Rating Scale and Objective Behavior Check List.

**Result:** The mean pain intensity score ( 1=4.3) during routine management was higher than the mean pain intensity score ( 2=1.7) during cutaneous stimulation. The calculated 't' value ( $t_{39}=10.6$ ) was greater than the table value ( $t_{39}=2.02, p<0.05$ ) showed that there was a significant difference between the pain intensity during AVFP in hemodialysis patients with routine management and cutaneous stimulation. The mean pain-related behavior score ( 1=6.3) during routine management was higher than the mean pain-related behavior score ( 2=2.7) during cutaneous stimulation. The calculated 't' value ( $t_{39}=11.8$ ) was greater than the table value ( $t_{39}=2.02, p<0.05$ ) showed that there was a significant difference between the PRB during AVFP in hemodialysis patients with routine management and cutaneous stimulation. Results suggesting that the intervention was effective in reducing the intensity of pain and pain-related behaviors during AVF puncture among hemodialysis patients. There was no significant association between pain intensity score, pain related behaviors with selected demographic variables.

**Conclusion:** The findings of the study have shown that the cutaneous stimulation is an effective intervention in reducing pain and pain-related behaviors during AVF puncture procedure in hemodialysis patients.

### INTRODUCTION

Renal patients are the frequent consumers of health care services and they do often experience pain during their treatment modalities like dialysis procedure. As renal patients are an increasing group of healthcare service users, and pain is affecting their everyday life, it is essential to individualize pain evaluation.<sup>2</sup> Arterio-Venous Fistula (AVF) cannulation is the source of pain because of its repetition like act, two to three times per week, 300 approximately per year by means of big needles gauge. This contributes to decreased patients life quality.<sup>3</sup>

### OBJECTIVES OF THE STUDY

- To determine the level of pain with routine management and cutaneous stimulation among the same hemodialysis patients during the arterio-venous fistula puncture as measured by Numerical Pain Rating Scale.
- To find the pain-related behaviors with routine management and cutaneous stimulation among the same hemodialysis patients during the arterio-venous fistula puncture as measured by Objective Behavior Check List
- To compare the level of pain with routine management and cutaneous stimulation during arterio-venous fistula puncture among the same group of hemodialysis patients.
- To compare the level of pain-related behaviors with cutaneous stimulation and routine management during arterio venous fistula puncture among the same group of hemodialysis patients.
- To find the association between the level of pain and pain-related behaviors with selected demographic variables of the hemodialysis patients

### MATERIALS AND METHODS

**Setting:** The study was conducted at the Dialysis unit of

Father Muller Medical College Hospital, Mangalore.

**Research Approach:** Evaluatory approach was used

**Research Design:** Pre- experimental one group post test only design

**Sample:** 40 hemodialysis patients with arterio-venous fistula who undergo hemodialysis on alternate days.

**Sampling Technique:** Purposive sampling method

### Inclusion Criteria:

- Patients in the age group of 21 and above
- Patients with AV fistula access for hemodialysis

### 7. Exclusion Criteria:

- Patients having psychiatric or neurological problem.
- Patients having altered level of consciousness.
- Patients suffering from pain of other origin than AV fistula
- Patients on analgesic medication

### DATA COLLECTION INSTRUMENTS:

#### TOOL I: Baseline Proforma

The baseline proforma consisted of 3 main items - **Demographic data, Socio economic data, Disease related data**

#### TOOL II: Numerical Pain Rating Scale

Standardized tool which was developed with 0-10 scale with '0' meaning 'No pain' and '10' meaning 'Worst pain'.

#### TOOL III : Objective Behavior Check List.

It is a check list with 4 main domains of pain- related behaviors; facial expression (6 items), verbal expression (6 items), body language (9 items)

**DATA COLLECTION PROCESS:**

The data was collected from the subjects who met the inclusion criteria by assessing the demographic, socio-economic and disease related data while they were waiting for dialysis, using the demographic proforma. A staff nurse of the unit performed the AVF puncture according to the unit schedule and the researcher assessed objective pain behaviors during the AVF puncture. Patients were asked immediately after the AVF puncture to tick on the Numeric Pain Rating Scale to indicate how strong their pain was, during AVF puncture. For the next hemodialysis visit, the same subjects were given cutaneous stimulation by the investigator along with routine management which was started 10 minutes prior to the puncture and continued until the puncture procedure completed and pain and pain-related behaviors were assessed as the same assessments procedure as day 1.

**MAJOR FINDINGS OF THE STUDY:**

The data was analyzed and presented under the following headings

**Section I : Baseline Characteristics**

Among the 40 hemodialysis patients, majority of the subjects 17(42%) belonged to the age group of 51-65 yrs, 4 (10%) subjects belonged to the age group of 21-35 years.

Majority of the subjects 29(73%) were males and 11 (27%) subjects were females.

Half of the subjects 20 (50%) had only primary education and 2 subjects (5%) had graduation as educational qualification.

Majority of the subjects 21 (52%) is 1-5yrs and 21 (37%) subjects had a duration of more than 5 years.

**Section II : Intensity of pain during RM and CS.**

During the routine management, 18 (45%) of the subjects had moderate intensity of pain, 15 (37%) of the subjects had mild intensity and 7 (18%) of the subjects had severe intensity of pain, whereas in the cutaneous stimulation, majority 26 (65%) of the subjects had mild intensity of pain, 9 (23%) of the subjects had no pain, 5 (12%) of the subjects had moderate level of pain intensity.

**Section III : Intensity of pain-related behaviors during RM and CS**

In routine management, 27 (67%) of the subjects showed mild pain-related behaviors and 13 (33%) of the subjects showed moderate pain-related behaviors whereas in cutaneous stimulation 2 (5%) subjects showed no pain-related behaviors and 38 (95%) subjects showed mild pain-related behaviors.

**Section IV : Effect of CS versus RM on pain intensity score**

Computed 't' value ( $t_{39} = 10.6$ ) is higher than the table value  $t_{39} = 2.02$ , ( $p < 0.05$ ) which shows that there is a significant difference in the level of pain during AVFP between the routine management and cutaneous stimulation among hemodialysis patients.

**Section V : Effect of CS versus RM on PRB**

Computed 't' value ( $t_{39} = 11.8$ ) is greater than the table value  $t_{39} = 2.02$  ( $p < 0.05$ ) shows that there is a significant difference between the pain-related behaviors during AVFP among the hemodialysis patients with routine management and cutaneous stimulation.

Section VI & VII : Association between the level of pain and PRB with demographic variables.

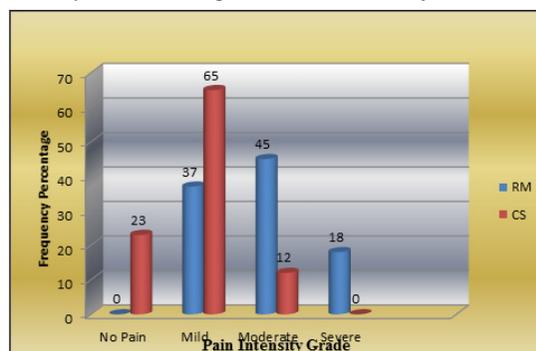
There is no significant association between pain score and PRB score during AVFP in routine management with the selected demographic variables of hemodialysis patients.

**CONCLUSION**

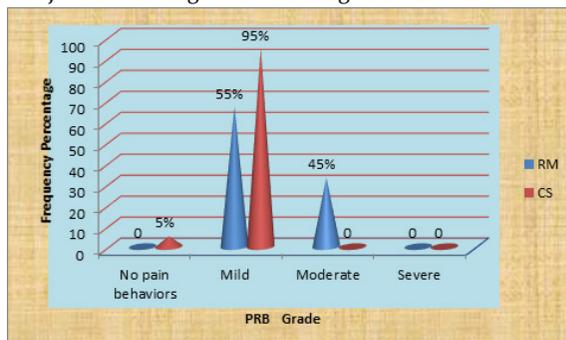
The following conclusions were drawn on the basis of the findings.

- The incidence of CKD was more in the age group of patients between 51-65ys..
- Hypertension and diabetes are the main co-morbidities associated with CKD.
- Hemodialysis patients experience pain during AVFP even after administering local anesthetic and need another supportive pain reduction measure during AVF puncture procedure.
- Cutaneous stimulation intervention was effective in reducing the intensity of pain and pain-related behaviors during AVF puncture procedure.

**Figure 1: Cylindrical Diagram Showing the Distribution of Subjects According to the Pain Intensity Grade**



**Figure 2: Conical Diagram Showing the Distribution of Subjects According to the Grading of PRB.**



**Table 1: Domain-wise Distribution of Range, Mean, Standard Deviation and Percentage Mean of Pain-Related Behaviors**

Day of Observation	Domain	Max. Score	Pain - Related Behaviors			
			Range	Mean ± SD	Mean %	n=40
Day -1 (RM)	Facial Expression	6	1-6	3.4	1.29	56.6
	Verbal Expression	6	0-2	0.5	0.6	8.3
	Body Language	9	0-5	2.2	1.08	24.4
Day-2 (RM+CS)	Facial Expression	6	0-3	1.7	0.9	28.3
	Verbal Expression	6	0-1	0.07	0.26	1.1
	Body Language	9	0-2	0.67	0.69	7.4

**Table 2: Mean, Mean Difference and ‘t’ value of Pain Intensity Score during AVFP among the Hemodialysis Patients with Routine Management and Cutaneous Stimulation**

Variable	Pain Intensity Score		‘t’ value	‘p’ value
	Mean	MD		
Day 1(RM)	4.3			
Day 2 (RM+CS)	1.7	2.6	10.6	0.001*

*t*<sub>39</sub> = 2.02, *p*<0.05 \* Significant

**Table 3. Mean Difference and ‘t’ value of Pain-Related Behaviors during AVFP among dialysis patients with Routine Management and Cutaneous Stimulation**

Variable	Pain – Related Behaviors		‘t’ value	‘p’ value
	Mean	MD		
Day 1(RM)	6.3			
Day2 ( RM+CS)	2.7	1.9	11.68	0.001*

*t*<sub>39</sub> = 2.02, *p*<0.05 \*Significant

**REFERENCES**

1. Crespo MR, Rivero AF, Contreras AM, Martinez GA, Fuentes GM. Pain degree and skin damage during arteriovenous fistula puncture. *Edtna Erea J*.2004Oct[Cited on 2016 Feb12];30(4):208- 12.Available from: <http://www.ncbi.nlm.nih.gov/pubmed/15835412>
2. Kafkia T, Vehvilainen-julkunen J, Sapountzi-krepia D. Assessment and management of pain in hemodialysis patients:A pilot study.[Internet] *Prog Health Sci*.2014 Apr[Cited 2015Dec20];4(1):53-60.Available from: <http://progress.umb.edu.pl/sites/progress.umb.edu.pl/files/53-60%20Kafkia.pdf>
3. Kaza BN, Sabi KA, Amekoudi EY, Immangue G, Badibanga J, et al. Pain during arterio-venous fistula(AVF) cannulation.(Internet) *AJIM*.2014 Sep[Cited2016Jan 15];2(5):87-9. Available from:doi: 10.11648/j.ajim.20140205.12
4. Fareed ME, El-shikh,El-hay A, Asmar H. Cutaneous stimulation:its effect on pain relieving among hemodialysis patients.*J.Edu.and Practice*2014;5(1).9-20.Available from:<http://www.iiste.org/Journals/index.php/JEP/article/view/10405>