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A Study to Assess the Atrioventricular Fistula Puncturing Pain among Adult Hemodialysis Patients after Providing Cryotherapy in the Selected Hospitals of Pune City

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Abstract: ***A renal failure is one of the most difficult health conditions a person has to deal with physically, mentally and financially. When a patients try to seek medical help they are already at the final stage where renal transplant is required, till then patient has to survive with the help hemodialysis which is main line of treatment for renal failure patient. Hemodialysis is done to regulate the kidney functions. It is done through the Atrioventricular Fistula which the vascular access for the hemodialysis. It is a painful procedure a patient needs to undergo minimum twice a week. The pain can be reduced with the help of using cryotherapy (ice application) prior to the atrioventricular fistula puncture. So, this study aims to assess the level of atrioventricular fistula puncture pain pre and post the cryotherapy. A pre - experimental pre - test post - test design of study is used on 10 patients undergoing hemodialysis through atrioventricular fistula from chosen hospital in Pune, India. A non - probability purposive sampling technique was used and data for both demographic and clinical variables are collected by the tool prepared by the researcher. A pain is measured by using the numerical pain rating scale.*** *Result:* ***A pre - experimental, pre - test post - test design was used on 10 renal failure patients to assess the effectiveness of cryotherapy on A. V. fistula puncturing pain and found that 60% of them were having moderate pain and 40% of them were having severe pain before giving cryotherapy. and later in post - test it is been observed that 70 % of them were not having any pain and 30% of them were having mild pain. Conclusion: This study conclude that hemodialysis patients were experiencing moderate to severe pain during AV fistula puncture and after providing Cryotherapy the pain has been reduced to mild to no pain. Thus, it indicates that cryotherapy has significant effect in reducing AV Fistula puncture pain among the patient's undergoing hemodialysis.***

Keywords: atrioventricular fistula, pain, adult, cryotherapy.

1. Introduction

Pain induced by the insertion of atrioventricular fistula canulation is a cause of concern in both children and adult on regular hemodialysis. Though atrioventricular fistula puncture cause pain, local anesthesia is not given due to its side effects like vasoconstriction, burning sensation, and infection. On an average, a patient on maintenance hemodialysis undergoes ten atrioventricular fistula punctures a month and would continue to do so throughout their lifetime or until a successful renal transplant. His or her comfort with the procedure is therefore of utmost importance for long - term compliance with the treatment. Alleviation of this pain might improve their acceptance of the procedure and thus, their quality of life. Many studies has been shown that cryotherapy can be used to reduce the pain.

Purpose

The study is directed towards assessing level of pain undergoing atrioventricular fistula puncture patients for hemodialysis pre and post cryotherapy.

2. Research Methodology

Research approach: Quantitative Approach

Research design: Pre experimental pre - test post - test design

Sample: Adults undergoing hemodialysis through atrioventricular fistula Sample size: 10

Sampling technique: Non - probability purposive sampling technique

Data collection technique: Data is collected by tool developed by researcher. The tool used in the study has two sections. Section A was questionnaire related to demographic data and clinical data of patient. Section B is aimed to monitor pain level with the help of numerical pain rating scale.

3. Result and Analysis

Section- A

Table 1: Demographic variables, *n=10*

Demographic variables	Frequency (percentage)
Age	
20 - 30 years	4 (40%)
30 - 40years	2 (20%)
40 - 50years	2 (20%)
>50 years	2 (20%)
Gender	
Male	4 (40%)
Female	6 (60%)
Others	0
Education	

Illeterate	3 (30%)
Middle class degree	6 (60%)
High school degree	1 (10%)
Graduate	0
Marital status	
Unmarried	3 (30%)
Married	6 (60%)
Widow	1 (10%)
Residence	
Rural	7 (70%)
Urban	3 (30%)
Family Income	
< 10, 000	1 (10%)
10, 000 - 20, 000	5 (50%)
20, 000 - 30, 000	4 (40%)
> 30, 000	0
Work Status	
Student	1 (10%)
Employed	5 (50%)
Self employed	2 (20%)

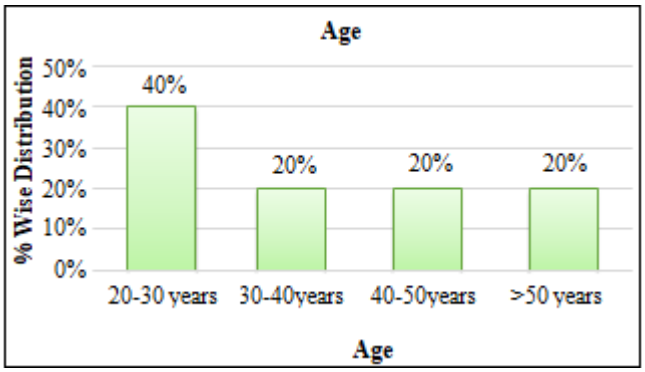

Figure 1: Age distribution (years), *n = 10*

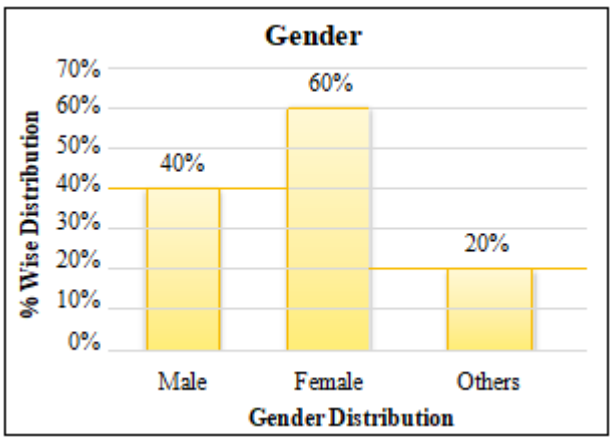

Figure 2: Gender distribution, *n = 10*

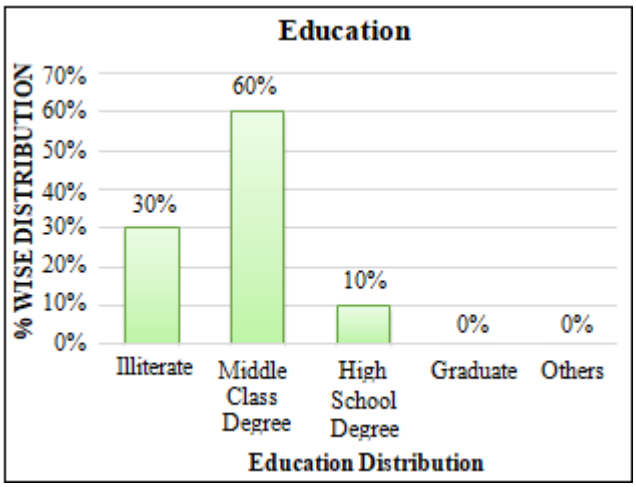

Figure 3: Educational status, *n =10*

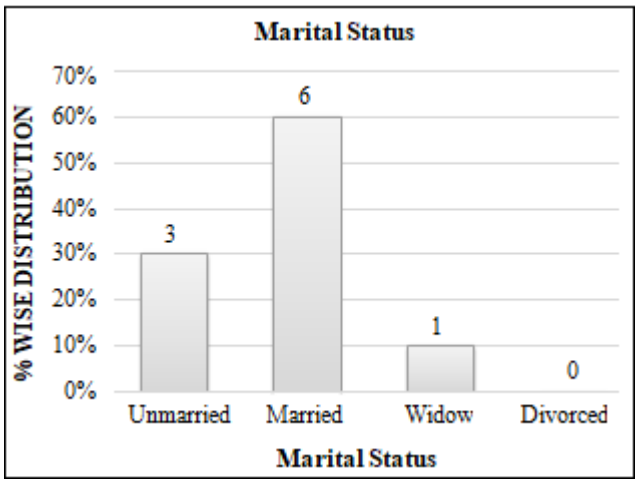

Figure 4: Marital Status, *n =10*

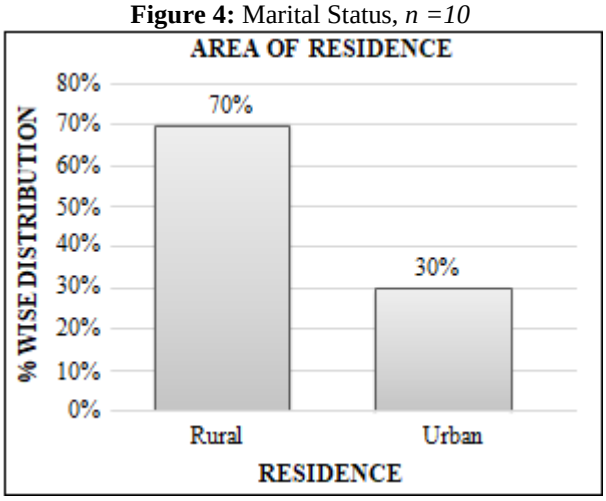

Figure 5: Residence distribution, *n =10*

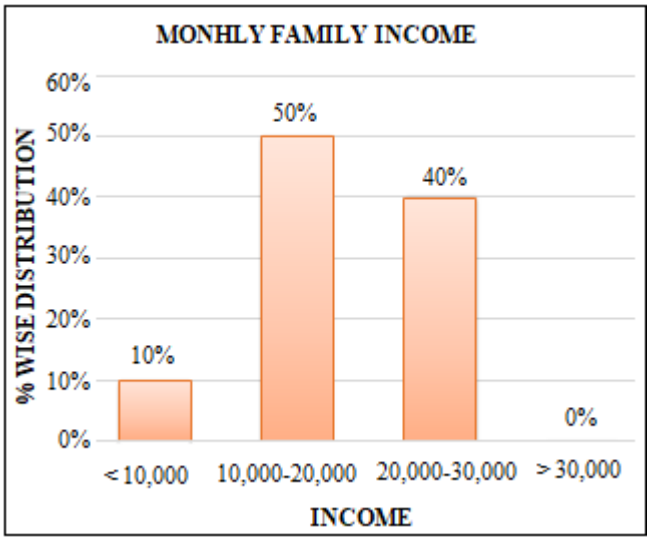

Figure 6: Monthly family income, *n=10*

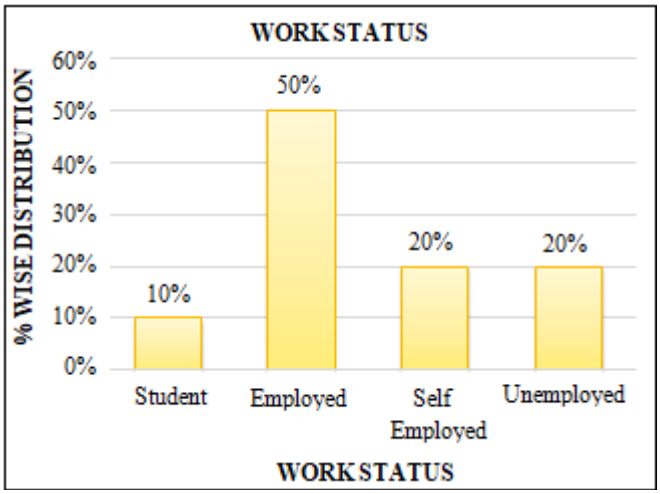

Figure 7: Work status, *n=10*

Table 2: Clinical Variables, *n =10*

Clinical Variables	Frequency (Percentages)
Duration Of Disease	
Less Than 5 Yrs	7 (70%)
5 - 10 Yrs	3 (30%)
More Than 10yrs	0
History Of Disease	
Acute	3 (30%)
Chronic	7 (70%)
Congenital	0
Duration Of Dialysis	
0 - 1 Years	4 (40%)
1 - 2 Years	5 (50%)
> 2 Years	1 (10%)
No Of Dialysis Per Week	
Once A Week	3 (30%)
Twice A Week	7 (70%)
Thrice A Week	0
Place Of Av Fistula	
Right Arm	4 (40%)
Left Arm	6 (60%)
Central Venous Access	0
Period Of Cryotherapy	
Less Than 2 Min	0
2 - 10 Min	10 (100%)
More Than 10 Min	0
Number Of Av Fistula	
Once	5 (50%)
Twice	5 (50%)
Thrice	0
Side Effects Of Av Fistula	
Redness	6 (60%)
Swelling	4 (40%)
Other	0
Occurance Of Sensitvity	
Less Than 2 Min	10 (100%)
2 - 10 Min	0
More Than 2 Min	0

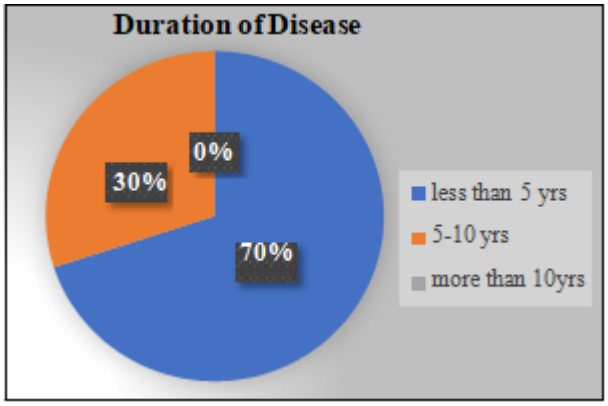

Figure 8: Duration of disease in years, *n=10*

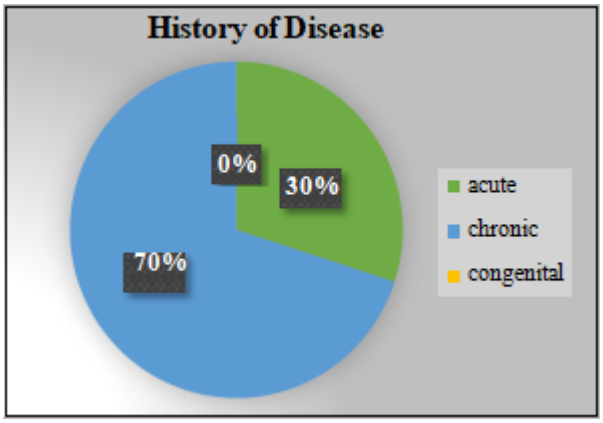

Figure 9: History of disease, *n=10*

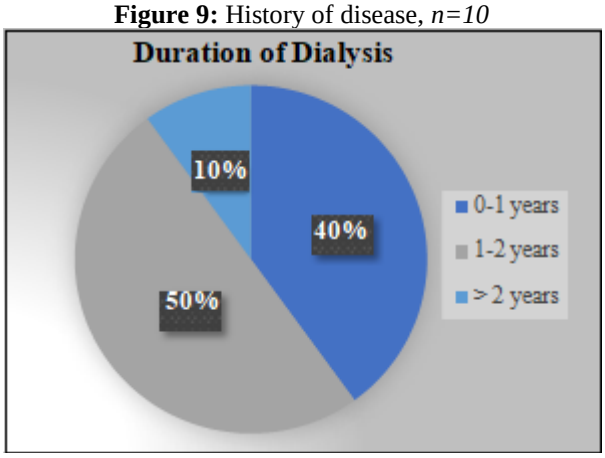

Figure 10: Duration dialysis, *n=60*

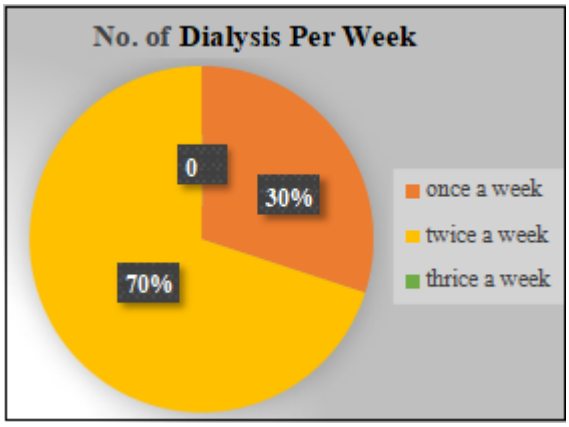

Figure 11: Dialysis per week, *n =10*

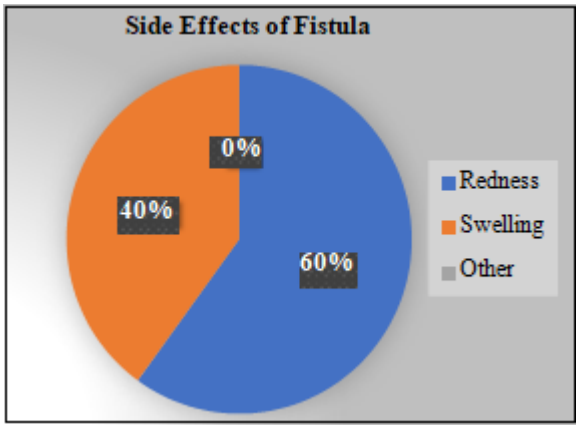

Figure 15: Side effect of AV fistula, *n=10*

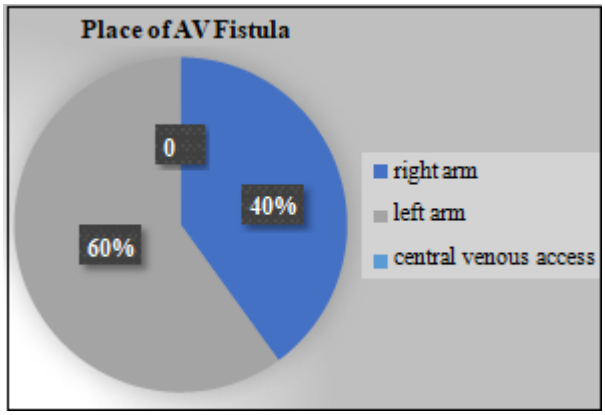

Figure 12: Place of AV fistula, *n=10*

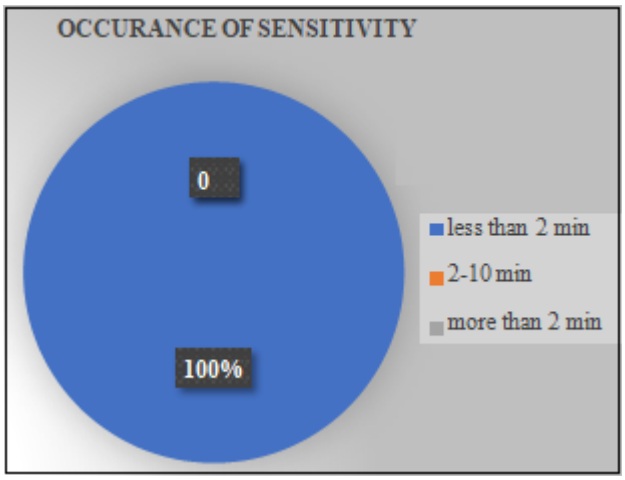

Figure 16: Occurrence of sensitivity, *n=10*

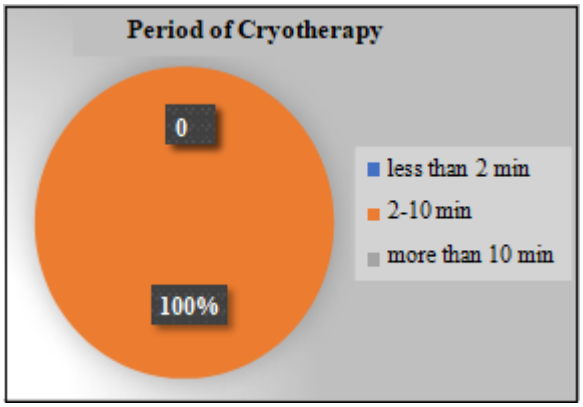

Figure 13: Period of cryotherapy, *n=10*

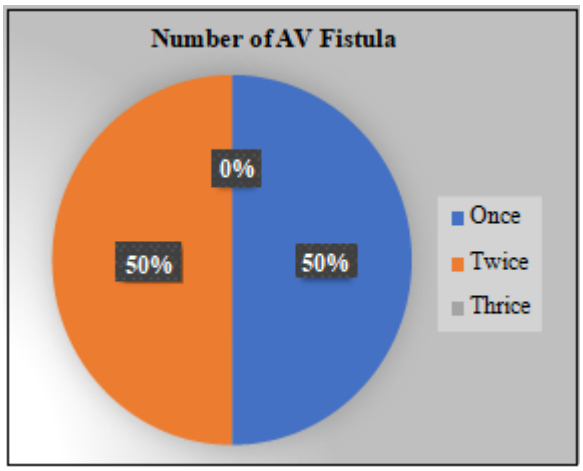

Figure 14: Number of AV fistula, *n=10*

Section B

Table 3: Evaluation of Numerical Pain Rating Scale Score, *n=10*

Level of numerical pain rating scale score	Score Range	Level of numerical pain rating scale score	
		Pre - test	Post - test
No Pain	0	0	7
Mild Pain	1	0	3
Moderate Pain	2	6	0
Severe Pain	3	4	0
Total		10	10
Minimum score		2	0
Maximum score		3	1
Mean NPRS score		2.40	2.1

4. Discussion

According to the study's statistical analysis, cryotherapy relieves the pain associated with atrioventricular fistula puncture. With the help of the distribution of the numerical pain rating scale, the hypothesis is statistically tested. To demonstrate the effectiveness of cryotherapy, the pain scores in the pre - test and post - test results are contrasted. Chi - square test is used to examine the significance of the difference between the pre and post numerical pain rating scale score, and the tabulated and computed "2" values are compared. Additionally, the calculated 'p' values are contrasted with the acceptable 'p' value of less than 0.0001.

The present study's results are consistent with a 2011 study by **Sivagami, R** on the effectiveness of cryotherapy on atriovenous fistula puncture related pain among clients undergoing hemodialysis. This study shows that cryotherapy helps in decreasing the level of AVF puncture related pain among clients undergoing hemodialysis.

A 2015 study by **Lijiya Jose, Diana Lobo** examined the effectiveness of cryotherapy on Atrioventricular Fistula Puncture related pain among patients undergoing hemodialysis. Quazi experimental time series design was used in this study. The study found that cryotherapy was effective in reducing subjective pain and objective behavioral response scores of atrioventricular fistula puncture related pain.

5. Conclusion

This study conclude that hemodialysis patients were experiencing moderate to severe pain during atrioventricular fistula and after providing cryotherapy the pain has been reduced to mild to no pain. Thus it indicates that cryotherapy is effective in reducing pain.

Ethical Clearance
The Institutional Research Committee (IRC) of Pune's Symbiosis International (Deemed University) has given its approval to this study. Additionally, the administrative head of the chosen hospital in Pune granted permission for this study to be carried out

Source of Funding: Self

Conflict of Interest: Nill

References

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