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A Study To Assess The Effectiveness Of Intradialytic Stretching Exercises On Muscle Cramps Among Patients Undergoing Hemodialysis At Ashwin Hospital, Coimbatore

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ABSTRACT

Hemodialysis is a life-saving treatment for patients with End Stage Renal Failure. It is a continuing process where patients experience complications such as hypotension, muscle cramps, disequilibrium syndrome and nausea during the procedure. **Objectives:** To assess the effectiveness of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis at Ashwin hospital, Coimbatore. **Methodology:** The research design adopted for this study was Quasi experimental pre test post test with control group design. As per the Inclusion criteria 60 samples were selected by using Nonprobability Purposive Sampling Technique and 30 each in both Experimental and Control group. Intradialytic stretching exercise were given for the patients under Experimental group at the end of the second hour and third hour of hemodialysis and control group receives only routine hospital care. Interview schedule method was used to assess the level of muscle cramps. **Results:** Descriptive and Inferential statistics were used to analyze the data. The findings revealed that in experimental group the pre-test mean and post test III mean score was 15.93 and 3.4, in control group the pre-test mean and post test III mean score was 16.7 and 13.2 respectively .The obtained paired "t" test value in experimental group in post test III was 20.638 and in control group in post test III was 6.655 which was significant at 0.05 level. The results showed that there was a significant difference in the level of muscle cramps between experimental and control group. **Conclusion:** The study concluded that intradialytic stretching exercises is a non-pharmacological therapy and cost-effective helps to reduce the muscle cramps among patients undergoing hemodialysis.

Keywords: Intradialytic, Muscle cramps, Intradialytic stretching exercises, Routine care

I. INTRODUCTION

"A gentle, sincere touch has as much healing power as mighty spoken words"

Everybody wants to be healthy , but very few make the effort to adopt a healthy habit on a day to day basis. The kidneys help to maintain homeostasis by regulating the concentration and volume of body fluids. End stage renal disease was the 12th most common cause of death, constitute for 1.1 million deaths around the world per year. It is an emergent global health problem.

Hemodialysis is commonly used as renal replacement therapy, which aim to eliminate excess fluids and waste products from the blood through the dialyzer and to carry a clear and filtered blood back to the patient. Hemodialysis is a life-saving treatment for patients with chronic kidney disease. Patients undergoing hemodialysis experience complications such as hypotension, muscle cramps and nausea during the procedure. Among that muscle cramps are the most common complication occur during hemodialysis session.

Muscle cramps can range in intensity from a slight twitch to a severe agonizing contraction, it lasts for few seconds to over 15 minutes and can be seen visibly by the way the muscle twitches and moves under the skin. Painful muscle cramps usually occur in the lower extremities are common in patients receiving chronic hemodialysis. The most commonly affected muscle groups are Back of lower leg/calf (gastrocnemius), Back of thigh (hamstrings)and Front of thigh (quadriceps). Less common muscles that may cramp include the upper arms and abdomen. These cramps frequently occur toward the end of the dialysis sessions, sometimes precede hypotension, and are associated with higher fluid removal during hemodialysis. The exact mechanism of reduction of muscle cramps were based on the concepts that cramps result from sudden electrolyte and fluid depletion during hemodialysis which is evident after half of the process. Calf muscles being the dwelling space of more than 20% of cardiac output, the stretching will redistribute the fluid and electrolytes causing reduction of cramps

STATEMENT OF THE PROBLEM

A study to Assess the Effectiveness of Intradialytic Stretching Exercises on muscle cramps among patients undergoing hemodialysis at Ashwin Hospital, Coimbatore.

OBJECTIVES OF THE STUDY

- To assess the level of muscle cramps among patients undergoing hemodialysis.
- To evaluate the effect of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis.
- To compare the effectiveness of intradialytic stretching exercises on muscle cramps between experimental group and control group of patients undergoing hemodialysis.
- To determine the association between the pre-test level of muscle cramps with demographic and clinical variables among patients undergoing hemodialysis.

HYPOTHESIS

- **H_1:** There is a significant reduction in post-test level of muscle cramps among experimental group receiving intradialytic stretching exercise.
- **H_2**: There is significant difference between post-test level of muscle cramps among samples of experimental and control group.
- **H_3**: There is a significant association in between pre-test level of muscle cramps among patient undergoing hemodialysis with their demographic and clinical variables

II. RESEARCH METHODOLOGY

Research Approach: In this study Quantitative research approach was adopted

Research Design: A Quasi experimental pre-test post - test with control group design was adopted in this study

Variables of the study: The independent variable of this study is Intradialytic stretching exercises. The dependent variable of this study is muscle cramps.

Setting of the study: This study was conducted in dialysis unit , at Ashwin hospital Coimbatore.

Population: The target population of the study were the patients undergoing hemodialysis and the accessible population were the patients undergoing hemodialysis with muscle cramps at Ashwin hospital, Coimbatore.

Sample size: The sample size comprises 60 patients with muscle cramps, out of which 30 were in experimental group and 30 in control group.

Sampling technique: Nonprobability purposive sampling technique was used for selecting the samples.

Sample: The samples selected for the present study were the patients with muscle cramps who met the inclusion and exclusion criteria undergoing hemodialysis in Ashwin hospital, Coimbatore. Consent for participation was obtained.

Ethical considerations: The institutional human ethics committee (IHEC) had reviewed the proposal and approved the study to conduct.

III . DESCRIPTION OF THE TOOL

The tool had the following sections:

Section A - Demographic data: It consists of demographic variables such as age, gender, educational status, monthly income, occupation, personal habits and type of diet.

Section B - Clinical variable: It consists of clinical variables includes onset of chronic kidney disease, duration of hemodialysis treatment, previous experience of muscle cramps, frequency of hemodialysis per week, period of experiencing muscle cramps, location of muscle cramps in legs, quality of life deteriorated ,muscles involved in cramps ,co-morbid condition, amount of fluid removed , measures to cope up with muscle cramps ,practice of doing exercise and pattern of muscle cramps.

Section -C –Assessment of Level of Muscle Cramps: The interview schedule method was used to assess the level of muscle cramps among patients undergoing hemodialysis for both experimental and control group by using self structured questionnaire prepared by investigator. The assessment tool consists of five characteristics of muscle cramps that ranges from 0-4 such as muscle tone assessment, frequency, duration, intensity of pain and quality of muscle cramps. For assessing intensity of pain during muscle cramps, the numerical rating scale has been used. The total score ranged from a minimum of zero to a maximum of twenty.

Score Interpretation: Total score = 20

Score	Level of muscle cramps
0	No cramps
1-7	Mild cramps
8-14	Moderate cramps
15-20	Severe cramps

IV .DATA COLLECTION PROCEDURE

A formal permission letter was obtained from the Medical Director of Ashwin Hospitals, Coimbatore to conduct the study. The purpose and duration of the study was explained to them and consent was obtained from the patients who are interested and willing to participate. Totally 60 samples were selected based upon inclusion and exclusion criteria by using non-probability purposive sampling technique (30 in experimental group and 30 in control group). Data was collected all the days except Sundays. All the samples cooperated during the data collection period. Routine hospital care was provided to all the samples included in this study. Pre-test was done on the first sitting of hemodialysis. The structured questionnaire using interview schedule technique was used to collect the data from the patients before hemodialysis begin.

The Investigator performed Intradialytic stretching exercises at the end of second hour and third hour for experimental group prophylactically ensuring privacy. The intervention was repeated for same patients at a frequency of 2 times per sitting for 3 days in experimental group. Post-test was done at the end of the hemodialysis session by using muscle cramp assessment tool through interview schedule method.

Control group received routine care as per the protocols, post-test level of muscle cramps was assessed with no intervention.

V .DATA ANALYSIS AND INTERPRETATION

- **Descriptive statistics**: Demographic and clinical data were analysed by using descriptive statistics. The method used were frequency and percentage distribution.
- **Inferential statistics:** The effectiveness of Intradialytic stretching exercises was analysed by using inferential statistics. The method used were paired 't' test, unpaired 't' test and chisquare.

VI .RESULTS AND DISCUSSION

1.Assessment of pre-test and post-test level of muscle cramps among patients undergoing hemodialysis in experimental and control group

Table 1: Frequency and percentage distribution of pre-test and post-test level of muscle cramps in experimental group

n= 30

S. No	Level of muscle cramps	Pre-test		Post-test I		Post-test II		Post-test III	
		f	%	f	%	f	%	f	%
1.	No	0	0	2	6.67	6	20	11	36.66
2.	Mild	1	3.33	6	20	10	33.33	16	53.34
3.	Moderate	3	10	10	33.33	9	30	2	6.67
4.	Severe	26	86.67	12	40	5	16.67	1	3.33

Table 2: Frequency and percentage distribution of pre-test and post-test level of muscle cramps in control group

n= 30

S. No.	Level of muscle cramps	Pre-test		Post-test I		Post-test II		Post-test III	
		f	%	f	%	f	%	f	%
1.	No cramps	0	0	3	10	1	3.33	1	3.33
2.	Mild	2	6.67	5	16.66	4	13.33	2	6.67
3.	Moderate	1	3.33	9	30	8	26.67	7	23.33
4.	Severe	27	90	13	43.34	17	56.67	20	66.67

2. Evaluate the effectiveness of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis in experimental and control group by using paired 't' test.

Table 3: Comparison of pre-test and III post-test level of muscle cramps among patients undergoing hemodialysis in experimental group using paired 't' test

n=30

S. No.	Experimental group	Mean	SD	Mean difference	Calculated 't'value	Table value
1.	Pre-test	15.93	2.976	12.53	**20.638***	2.05
2.	Post-test III	3.4	3.693			

Statistically significant - * p <0.05

Table 3 explains that the calculated 't' value **20.638** was greater than table value 2.05 at p=0.05 level of significance. This indicated that there is a significant difference between the pre-test and the third post-test level of muscle cramps score among patients who received intradialytic stretching exercises. Hence the intradialytic stretching exercises was effective in reducing muscle cramps among the patients undergoing hemodialysis.

Table 4: Comparison of pre-test and III post-test level of muscle cramps among patients undergoing hemodialysis in control group using paired 't' test

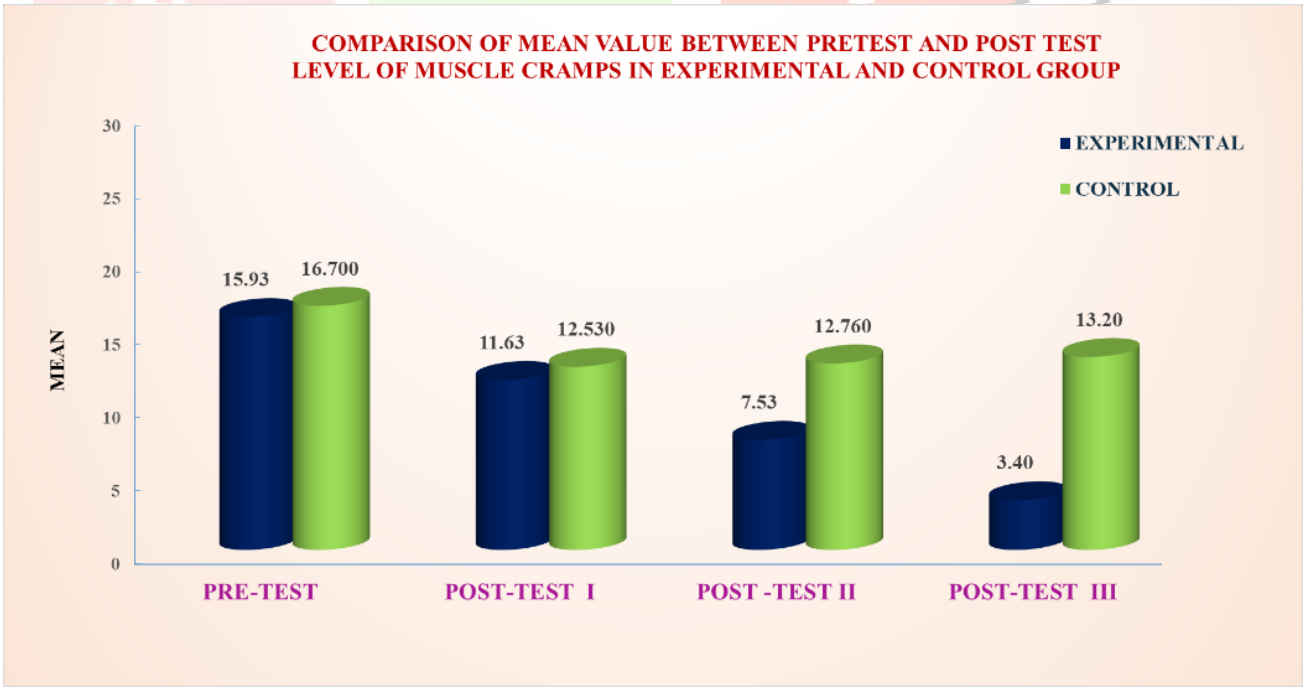
n=30

S. No.	Control group	Mean	SD	Mean difference	Calculated 't' value	Table value
1.	Pre-test	16.7	3.153	3.5	**6.655***	2.05
2.	Post-test III	13.2	4.110			

Statistically significant - * p <0.05

The above table 4 portraits the paired 't' test value **6.655** which is greater than 2.05. This indicates that there is significant difference between the pre-test and third post-test score level of muscle cramps among patients due to usual nursing care provided to the patients inorder to relieve muscle cramps.

Fig 1: Comparison of Mean Value between Pre-Test and Post Test level of Muscle Cramps score among patients undergoing Hemodialysis in Experimental and Control group



3. Compare the effectiveness of intradialytic stretching exercises on muscle cramps between experimental and control group of patients undergoing hemodialysis by using independent 't' test.

Table 5: Comparison of intradialytic stretching exercises and routine treatment on muscle cramps between experimental and control group of patients undergoing hemodialysis in post-test III scores using independent 't'test

n =60

S. No.	Study group	Level of muscle cramps		Calculated 't' value	Table value
		Mean	SD		
1.	Experimental group	3.4	3.693	**9.548***	2.02
2.	Control group	13.2	4.110		

Statistically significant - * p <0.05

The Table 5 reveals that the Independent calculated 't' value 9.548 is greater than 't' table value 2.02. There is a significant difference in the level of muscle cramps after intradialytic stretching exercise between experimental group and control group in post-test III scores. It implies that the intradialytic stretching exercises were effective in reducing muscle cramps among hemodialysis patients in experimental group.

4. Determine the association between the pre-test level of muscle cramps with demographic and clinical variables among patients undergoing hemodialysis by using chi-square test.

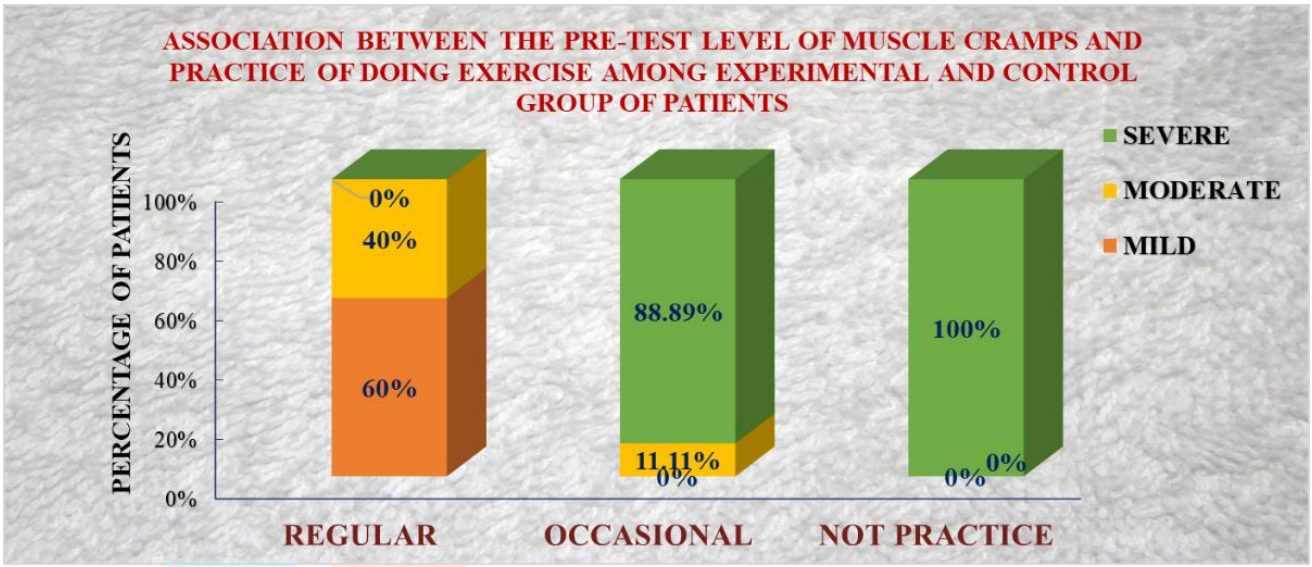
Table 6: Association between the Pretest level of muscle cramps among patients undergoing hemodialysis in both experimental and control group with their demographic and clinical variables.

S. No.	Demographic and Clinical Variables	Pre test level of muscle cramps						Total	Chi-Square Test value
		Mild		Moderate		Severe			
		f	%	f	%	f	%		
1	**Practice of doing exercise**								**c2=49.37* df = 6 P=12.59 S**
	Regular	3	60%	2	40%	0	0%	5	
	Occasional	0	0%	2	11.11%	16	88.89%	18	
	Not practice	0	0%	0	0%	37	100%	37	

S- Significant at *p <0.05

Table 6 shows there was no association between the pre test level of muscle cramps and demographic variables. In clinical variable it was inferred that practice of doing exercise had significant association between the pre test level of muscle cramps among patients undergoing hemodialysis. It was found there was no association between the other clinical variables and the pre test level of muscle cramps.

Fig 2: Percentage distribution of Association between the Pre-test level of muscle cramps and Clinical Variable of practice of doing exercises among patients undergoing Hemodialysis in Experimental and Control group



VII. CONCLUSION

- Muscle cramps are the most prevalent intradialytic complication and it is a subject feeling that can be expressed by all patients. The main conclusion drawn from this present study was that most of the patient undergoing hemodialysis had significant level of muscle cramps.
- The results revealed intradialytic stretching exercises is a cost-effective and non-pharmacological therapy used to reduce the muscle cramps for the patients undergoing hemodialysis. This can be added as an adjunct treatment for hemodialysis patients.
- Regular stretching exercises during hemodialysis improves the quality of life among patients. Thus, this study proved the effectiveness of intradialytic stretching exercises on muscle cramps among patients undergoing hemodialysis.

VIII. RECOMMENDATIONS

- Training can be provided to the staff nurses regarding passive intradialytic stretching exercises on calf muscle.
- Structured teaching programme can be planned on topic of active intradialytic stretching to the patients undergoing hemodialysis.
- A comparative study can be conducted between pharmacological and non- pharmacological intervention for muscle cramps during hemodialysis.
- A similar study can be conducted on larger scale for more valid generalizations.

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