

# **A PRE EXPERIMENTAL STUDY TO ASSESS THE EFFECT OF INTRADIALYTIC STRETCHING EXERCISES ON MUSCLE CRAMPS AND MUSCLE STRENGTH AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE UNDERGOING HEMODIALYSIS AT SELECTED HOSPITAL, PUDUCHERRY.**

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## **ABSTRACT**

A pre experimental study was carried out in Kidney Centre, Puducherry to assess the effect of intradialytic stretching exercises on muscle cramps and muscle strength among patients with chronic kidney disease undergoing hemodialysis. A total 40 sample was selected by using non probability convenient sampling technique and intradialytic stretching exercise for 15 to 20 minutes during the end of second hour of hemodialysis was given for the samples and post test was conducted at the end of fourth hour of hemodialysis.. Data was collected before and after intervention by using structured questionnaire, modified muscle cramps scale and muscle strength scale. The study results revealed that the mean muscle

cramps score was 5.95 in the pretest was reduced to 1.12 in the posttest ( $p < 0.001$ ), whereas the mean muscle strength score was 3.97 in the pretest was reduced to 4.82 in the posttest ( $p < 0.001$ ). The study concluded that the Intradialytic stretching exercise was effective to relieve the muscle cramps and improve muscle strength among patients with chronic kidney disease undergoing hemodialysis.

Key words: Intradialytic stretching exercise, chronic kidney disease, hemodialysis

## **INTRODUCTION:**

Every year about 2.2 Lakh new patients of End Stage Renal Disease (ESRD) get added in India resulting in additional demand for 3.4 Crore dialysis every year. It is estimated that 33 to 86% of patients experience muscle cramps during haemodialysis, which results in early termination of haemodialysis session.

## **NEED FOR THE STUDY**

Based on the reviews and the personal clinical experience in dialysis unit the investigator found that more than 75% of patients attending hemodialysis unit is experiencing muscle cramps. So the investigator has interested to test the non pharmacological remedial measure for this muscle cramps and she had selected intradialytic stretching exercise to prevent muscle cramps and to improve the muscle strength.

## **STATEMENT OF THE PROBLEM:**

A pre experimental study to assess the effect of intradialytic stretching exercises on muscle cramps and muscle strength among patients with chronic kidney disease undergoing hemodialysis at selected hospital, Puducherry.

## **OBJECTIVES:**

1. To assess the level of muscle cramp and muscle strength among patients with Chronic Kidney Disease (CKD) undergoing haemodialysis
2. To evaluate the effectiveness of intradialytic stretching exercise on muscle cramp and muscle strength among patients with CKD undergoing haemodialysis

3. To find out association between the pretest level of muscle cramp and muscle strength and the selected demographic variables of patients with CKD undergoing haemodialysis.

## **MATERIALS AND METHODS:**

A pre experimental design with one group pre test and post test was adopted for this study. A sample size of 40 patients undergoing hemodialysis who experienced muscle cramps during dialysis was included in the study using non probability convenient sampling technique. The investigator performed stretching exercise to the samples at the end of the second hour of hemodialysis. The data was collected through structured questionnaire, modified muscle cramps scale and muscle strength scale before hemodialysis and at the end of the fourth hour of hemodialysis. Data were collected and analyzed by using descriptive and inferential statistics.

Content validity of the tool was established on the basis of expert judgment. The reliability of the tool was established by inter rater reliability method and found to be highly reliable. Pilot study was conducted among 5 patients with chronic kidney disease undergoing hemodialysis at MVR, hospital, Puducherry.

## **DESCRIPTION OF THE INTERVENTION**

Different techniques of intradialytic stretching exercises are as follows:

1. Straight leg extension Exercise (Thigh-Hamstrings muscle)
2. Seated Marching (Thigh Front and Back-Quadriceps muscle)
3. Leg stretch (Leg front & back ankle)

**ANALYSIS AND INTERPRETATION:****Section A: Assessment of Muscle Cramps and Muscle Strength among Patients with CKD undergoing HD****Table : Assessment of Level of Muscle Cramps among Patients with CKD Undergoing HD in the pretest and posttest****N = 40**

Muscle cramps	Pretest		Posttest	
	No.	%	No.	%
<b>Occurrence of number of leg cramps experienced during one HD sitting</b>				
No leg cramps	0	0	29	72.5
Less than 2 cramps	13	32.5	11	27.5
2 to 3 times	26	65.0	0	0
More than three times	1	2.5	0	0
<b>Average duration of each leg cramps</b>				
No leg cramps	0	0	28	70.0
Less than 2 minutes	18	45.0	12	30.0
2 to 5 minutes	22	55.0	0	0
More than five minutes	0	0	0	0
<b>Pain intensity</b>				
No Pain	0	0	20	50.0
Mild Pain	2	5.0	18	45.0
Moderate Pain	8	20.0	2	5.0
Severe Pain	30	75.0	0	0

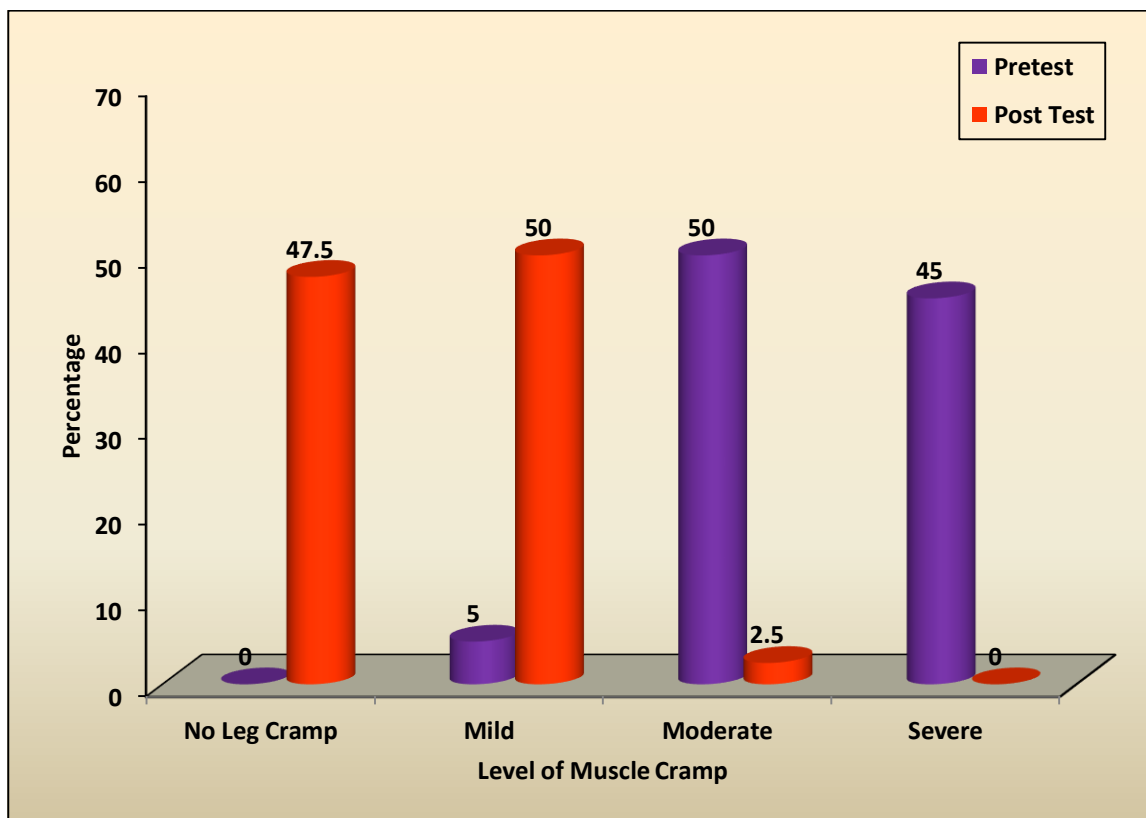
The table shows that in the pretest with regard to occurrence of number of leg cramps experienced during one HD sitting majority 26 (65%) experienced 2 to 3 times, 13 (32.5%) experienced less than 2 cramps and only one (2.5%) experienced more than three times. Whereas in the post test after the intervention, majority 29 (72.5%) experienced no leg cramps and 11 (27.5%) experienced less than 2 cramps.

Regarding average duration of each leg cramps in the pretest, majority 22 (55%) experienced for 2 to 5 minutes and 18 (45%) experienced for less than 2 minutes. Whereas in the post test, majority 28 (70%) experienced no leg cramps and 12 (30%) experienced for less than 2 minutes.

Considering the pain intensity in the pretest, majority 30 (75%) had severe pain, 8 (20%) had moderate pain and only 2 (5%) had mild pain, whereas in the post test after the intervention, majority 20 (50%) experienced no pain, 18 (45%) experienced mild pain and only 2 (5%) experienced moderate pain.

**Figure : Frequency and Percentage Distribution of Level of Muscle Cramps among Patients with CKD undergoing HD in the pretest and post test**

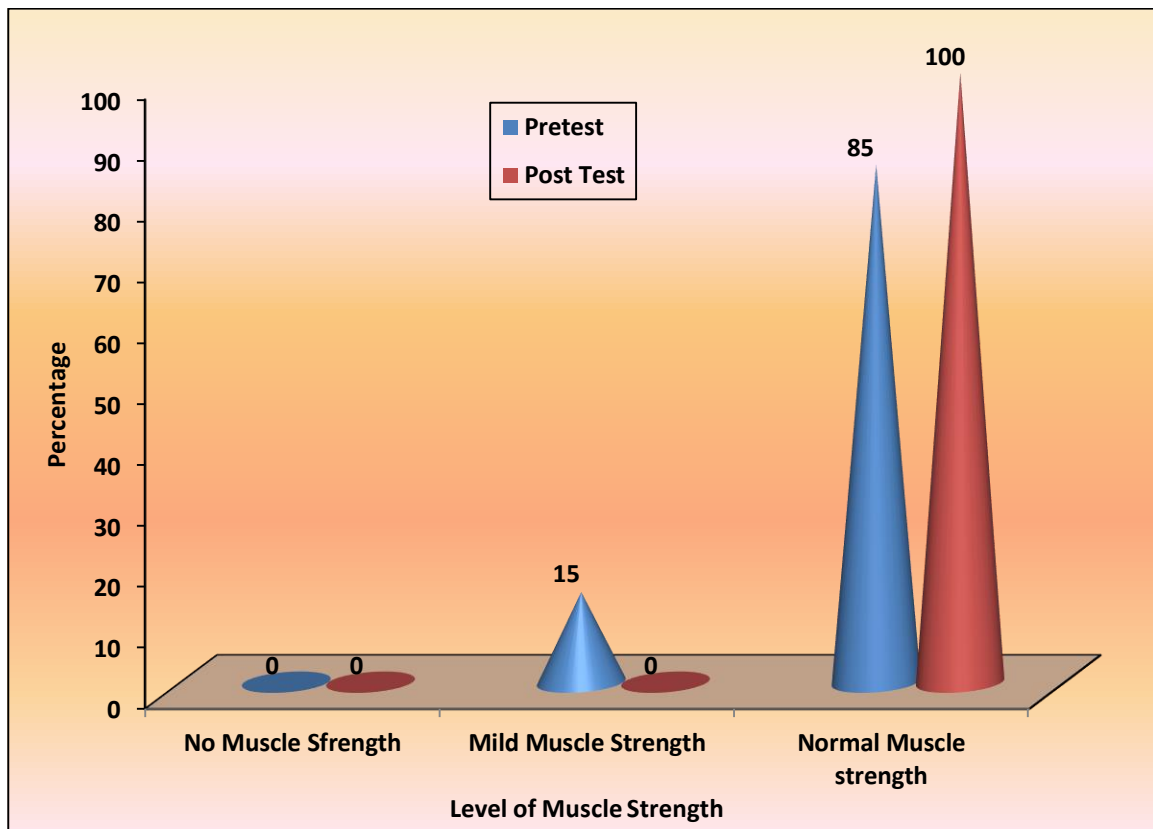
N = 40



The figure depicts that in the pretest, 20 (50%) had moderate level of muscle cramps, 18 (45%) had severe muscle cramps and 2 (5%) had mild level of muscle cramps among patients with CKD undergoing HD, whereas in the post test, 20 (50%) had mild level of muscle cramps, 19 (47.5%) had no leg cramps and only one (2.5%) had moderate level of muscle cramps.

**Figure : Frequency and Percentage Distribution of Level of Muscle Strength among Patients with CKD undergoing HD in the pretest and post test**

N = 40



The figure portrays that in the pretest, 34 (85%) had normal muscle strength and 6 (15%) had mild muscle strength whereas in the post test almost all 40 (100%) had normal muscle strength among patients with CKD undergoing HD.

**Section B: Effect of Intradialytic Stretching Exercises on Muscle Cramps and Muscle****Strength among patients with CKD undergoing HD****Table : Comparison of Level of Muscle Cramps Score and Muscle Strength Scores among Patients with CKD undergoing HD in the pretest and post test**

N = 40

Variables	Pretest		Posttest		Mean Difference	Paired 't' value	P value
	Mean	S.D	Mean	S.D			
Muscle Cramps	5.95	1.29	1.12	1.32	4.82	<b>20.577</b>	<b>0.0001*** S</b>
Muscle Strength	3.97	0.53	4.82	0.38	0.84	<b>10.077</b>	<b>0.0001*** S</b>

\*\*\*p &lt; 0.0001, S – Significant

The table depicts that the pretest mean muscle cramps score was  $5.95 \pm 1.29$  and the post test mean score was  $1.12 \pm 1.32$ . The mean difference score was 4.82. The calculated paired 't' value 20.577 was found to be statistically highly significant at  $p < 0.0001$  level and it was represented in the figure 6. The pretest mean muscle strength score was  $3.97 \pm 0.53$  and the post test mean score was  $4.82 \pm 0.38$ . The mean difference score was 0.84. The calculated paired 't' value 10.077 was found to be statistically highly significant at  $p < 0.0001$  level.

## Section C: Relationship between Muscle Cramps and Muscle Strength Score among patients with CKD undergoing HD

**Table : Correlation between the level of muscle cramps and muscle strength score among patients  
with CKD undergoing HD in the post test**

N = 40

Variables	Mean	S.D	‘r’ Value	P Value
Muscle Cramps	1.12	1.32	<b>- 0.359</b>	<b>0.023*</b> <b>S</b>
Muscle Strength	4.82	0.38		

\*p < 0.05, S – Significant

The table shows that the post test mean score of muscle cramps was  $1.12 \pm 1.32$  and the post test mean score of muscle strength was  $4.82 \pm 0.38$ . The calculated Karl Pearson’s Correlation value of  $r = -0.359$  shows a negative correlation which was found to be statistically significant at  $p < 0.05$  level, which clearly indicates that when the level of muscle cramps among patients with CKD undergoing HD decreases their muscle strength increases.

### RESULTS AND DISCUSSION:

#### 1. Findings related to demographic variables

- Majority 20(50%) were in the age group of 41 – 50 years, 27(67.5%) were male, 30(75%) were Hindus, 22(55%) were residing in rural area, 11(27.5%) had primary education, 25(62.5%) were moderate workers, and 19(47.5%) were earning a family income of Rs.12,020 – 16,019 per month.
- Almost all 40 (100%) had other co morbid condition, 30(75%) had been suffering from chronic kidney disease for 1 – 4 years, 22(55%) were undergoing hemodialysis for less than 1 year, 31(77.5%) undergo hemodialysis twice a week, 33(82.5%) were not taking calcium tablet, 34(85%) often get cramps in calf muscle and 34(85%) were not aware of stretching exercise to reduce muscle cramps while underoging hemodialysis.



## **2. Findings related to the assessment of level of muscle cramp and muscle strength among patients with CKD undergoing haemodialysis**

- In assessment of pretest and posttest level of muscle cramps among patients with CKD undergoing hemodialysis revealed that 20(50%) had moderate level of muscle cramp, 18(45%) had severe muscle cramp and 2(5%) had mild level of muscle cramp in the pretest, whereas in the post test, 20(50%) had mild level of muscle cramp, 19(47.5%) had no leg cramp and only one (2.5%) had moderate level of muscle cramp.
- In assessment of pretest and posttest level of muscle cramps among patients with CKD undergoing hemodialysis revealed 34(85%) had normal muscle strength and 6(15%) had mild muscle strength in the pretest, whereas in the post test almost all 40(100%) had normal muscle strength.

## **3. Findings related to the effectiveness of level of muscle cramp and muscle strength among patients with CKD undergoing haemodialysis**

- Effect of intradialytic stretching exercise on muscle cramp and muscle strength among patients with CKD undergoing hemodialysis had the pretest mean muscle cramp score was 5.95 and the post test mean score was 1.12. The mean difference score was found to be statistically highly significant at  $p < 0.001$  level. The pretest mean muscle strength score was 3.97 and the post test mean score was 4.82. The mean difference score was found to be statistically highly significant at  $p < 0.001$  level.
- The present study revealed that the intradialytic stretching exercise administered to the patients with CKD undergoing hemodialysis had significant decrease in their level of muscle cramp and improvement in their level of muscle strength.

#### **4. Findings related to the relationship between level of muscle cramp and muscle strength among patients with CKD undergoing haemodialysis**

- Relationship between muscle cramp and muscle strength score among patients with CKD undergoing hemodialysis was calculated using Karl Pearson's Correlation value of  $r = -0.359$  shows a negative correlation which was found to be statistically significant at  $p < 0.05$  level, which clearly indicates that when the level of muscle cramp among patients with chronic kidney disease undergoing hemodialysis decreases their muscle strength increases.

#### **5. Findings related to an association between the pretest level of muscle cramp and muscle strength and the selected demographic variables of patients with CKD undergoing haemodialysis**

- The demographic variable age had shown statistically significant association with pretest level of muscle cramp and muscle strength among patients with CKD undergoing hemodialysis at  $p < 0.001$  level and the other demographic variables had not shown statistically significant association with pretest level of muscle cramp among patients with chronic kidney disease undergoing hemodialysis.

#### **CONCLUSION:**

This study implies that most of CKD patients undergoing hemodialysis had frequent leg muscle cramps with variant intensity during the hemodialysis session. After applying stretching exercise session for those patients, it revealed a significant level of reduction in the muscle cramps and improvement in muscle strength was found. Thus it is concluded that, intradialytic stretching exercise is an effective technique and simple and safe strategy in reduction of muscle cramps and improves muscle strength among patients with CKD undergoing hemodialysis.

**RECOMMENDATION:**

- ❖ Training can be provided to the staff nurses regarding intradialytic stretching exercises.
- ❖ Structured teaching programme on intradialytic stretching exercises can be provided to the patients undergoing haemodialysis.
- ❖ Encourage the patients to note the frequency of muscle cramps in a diary after performing the exercises.
- ❖ Intradialytic stretching exercises can be adapted as a procedure to the patients undergoing haemodialysis.
- ❖ Nurses can introduce the evidenced based practice of doing these stretching exercises during the haemodialysis session.

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