

Hemodialysis Patients at Selected Hospital Smch: "Effectiveness of Intradialytic Stretching Exercises on Muscle Cramps and Bio-Markers."

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Abstract

In this study, patients receiving haemodialysis at Saveetha Medical College and Hospital were evaluated to determine the impact of intradialytic stretching exercises on muscle cramps and biomarkers. In the study, a random sampling technique was used in a quasi-experimental pretest-and-posttest design. Using a random sampling procedure, 60 samples were chosen, divided into two groups (30+30 each), and 30 were assigned to the experimental group and 30 to the control group, respectively. The samples' pre-test level of muscle cramping was measured using a self-structured questionnaire method, along with their demographic information. The level of muscle cramping after the test was measured in both groups using the same questionnaire only in the experimental group, which underwent intradialytic stretching exercises on three consecutive dialysis cycles. Despite the pretest having a mean score of 1.83 and a standard deviation of 0.83. **The objectives were**

1. To assess the demographic variables among the patients.
2. To assess the pretest levels of muscle cramps and bio -makers among client undergoing hemodialysis in both experimental & control group.
3. To determine the effectiveness of intradialytic stretching exercise among client undergoing hemodialysis in experimental group.
4. To compare the posttest level of muscle cramps and bio-makers among clients undergoing hemodialysis in both experimental group and control group.
5. To find out the association between the posttest level of muscle cramps and selected bio markers among client undergoing hemodialysis with their selected demographic variables.

Keywords: muscle cramps, intradialytic, stretching, haemodialysis, biomarkers,

1. Introduction

A serious public health issue on a global scale, chronic kidney disease (CKD) causes fatal effects include a gradual loss of renal function, cardiovascular illness, and early mortality [1].

A huge variety of diverse disease processes lead to CKD, which alters the kidney's structure and function permanently over the course of months or even years. A prolonged decline in renal function and damage to the renal structure are necessary for the diagnosis of CKD [2]. The main risk factors for CKD include advanced age, hypertension, diabetes mellitus, obesity, and family history. [3]. Early recognition and timely care of these high-risk individuals are necessary to obtain improved patient outcomes.

Family members of end-stage, or stage five, patients with chronic kidney disease are thought to be at significant risk for developing the disease. [4]. In Georgia, North Carolina, and South Carolina, 20% of dialysis patients reported having first- or second-degree relatives with ESRD [5].

13.9% of individuals with ESRD's family members had creatinine clearance lower than 60 ml/min, and 49.3% had undiagnosed renal disease [6].

Numerous recent research found that 15.8% of relatives of hemodialysis users had CKD. However, racial disparities and screening techniques may have contributed to the considerable variability in the incidence. [7]. Hemodialysis, an artificial kidney that eliminates undesirable chemicals and enhances arterial blood flow to important organs, is the most popular therapy for renal failure. It may not entirely cure uremia in ESRD patients, and it occasionally may also be accompanied by lower-extremity discomfort that interferes with everyday activities.

One of the most efficient forms of therapy for ESRD patients is hemodialysis (HD) (8). Patients with end-stage renal disease are living longer because to HD, but they are still dealing with a number of intradialytic problems (9). These issues might arise from the condition itself or the course of therapy, significantly compromising the quality of life of the patient (10). Hypotension, nausea, cramping muscles, flushing of the face, vomiting, headache, increased itchiness, chest discomfort, fever, and chills are the most common intradialytic side effects. (11) The most typical side effect of hemodialysis for patients is cramping in the muscles. A painful involuntary muscular contraction is how it is defined. Typically, triceps and gastrocnemius muscles are

involved. The main issue that patients experience during dialysis is a feeling of muscular cramp, which has consistently been treated as a postoperative condition in a hospital environment with normal saline and 25% dextrose. Muscle cramps impacted around 61% of patients receiving hemodialysis. (12). The symptoms of a muscle cramp include an abrupt onset of discomfort, an involuntary contraction of the skeletal muscle that starts with fasciculations, and a connection between the cramp and nerve conduction rather than the actual muscles. The most often afflicted muscles are the hamstrings, triceps, quadriceps, and gastrocnemius. (13). Although the exact cause of muscle cramps is unknown, common identified triggers include excessive intradialytic weight gain, electrolyte abnormalities, tissue hypoxia brought on by hypotension and vasoconstriction, the prescription for dialysis (blood flow rate and ultra filtration), and dialysate composition (14). Since intra-dialytic muscular cramp is the most frequent cause of early HD session termination, it may have significant effects on patients undergoing HD (15). Additionally, it might result in decreased fluid elimination, poor waste product clearance, fluid overload, hypertension, and a higher mortality risk (16). Additionally, muscular cramps have a severe impact on patients' quality of life and sleep. In severe circumstances, it could influence a patient's choice to eventually stop receiving dialysis therapy (17). Warm compresses, oral drugs, stretching exercises, intravenous fluids, and adhering to a set diet are among therapeutic methods for treating muscular cramps (18). A nurse's primary duty is to reduce and prevent the occurrence of muscular cramps by advising patients to refrain from excessive intradialytic weight gain and encouraging them to perform intradialytic stretching exercises (19) An essential part of nursing care that can lower the fatality rate and problems from toxins among hemodialysis patients is education of the patient. Patients are motivated to modify and follow dietary guidelines via dietary counselling and education. In randomised clinical studies assessing patient education for renal disease, improvement in patient knowledge has commonly been referred to as a main outcome (20).

Even though dialysis is a life-saving treatment for those with kidney failure, it has an impact on the patient's daily activities and quality of life. Due to its impact on sleep patterns, social interactions, and activity levels at work and home as a result of the

daily maintenance requirements and medicines, dialysis is affected [21]. 90% of people receiving hemodialysis for renal failure complain of muscular cramping. Exercise and light massage can help to decrease muscle cramps while receiving dialysis. Stretching exercises during dialysis (IDE) should be done since they might ease muscular cramping. [22]

2. Materials and Methods

For this work, a quantitative technique was used together with a quasi-experimental pretest-posttest design and control group. The study was carried out with the head of Saveetha Hospital's approval. By using the purposive sampling approach, 60 samples in total were chosen who satisfied the inclusion requirements. The participants were enticed into the study, given a thorough explanation of its goals, and given the opportunity to provide signed informed consent. A self-structured questionnaire was used to capture demographic information and the severity of muscular cramping. Data were gathered, collated, and evaluated using descriptive and inferential statistics following a period of intradialytic muscle strengthening training [1].

3. Results and Discussion

Section A: Description of The Demographic Variables of The Patients.

According to the study, the majority of the samples were between the ages of 31 and 40. There were 83.3% men overall. 56.7% of the samples were mostly Hindu. A monthly income of Rs 10,000 is earned by 36.7%. Despite the fact that the majority of them came from metropolitan areas, this table still exists. 66.7% work in a moderate environment, while 73.3% are not vegetarians. 43.3% of the samples' total population had received dialysis therapy for a full year.

Despite the fact that 83.3% of them experienced muscular cramps while receiving hemodialysis treatment—56.6% had ongoing cramps, while 73% had intermittent ones—the majority of them—36.7%—went for hemodialysis three times each week.

SECTION B: 1. Evaluation of the level of muscle cramps in the experimental and control groups before and after the test.

Table 1 shows the prevalence and percentage distribution of muscular cramps at the pre- and post-test levels in the experimental and control groups.

Group	Muscle cramps	Mild		Moderate		Severe	
		No.	%	No.	%	No.	%
Experimental Group	Pretest	13	43.33	9	30.0	8	26.67
	Post Test	14	46.67	14	46.6	2	6.6
Control Group	Pretest	10	33.33	5	16.6	15	50
	Post Test	15	50.0	10	33.33	5	16.67

In the experimental group's pretest, 13 patients (43.33%) had mild, 9 patients (30%) had moderate,

and 8 patients (26.67%) had severe staining. In contrast, in the experimental group's posttest, 14

patients (46.67%) had mild, 14 patients (46.6%), had moderate, and 2 patients (6.6%) had severe staining. According to the study, among patients in the control group's pretest, 10 (33.33%) had mild symptoms, 5 (16.6%) had moderate symptoms, and 15 (50%) had severe symptoms, but in the group's posttest, 15 (50%) had light symptoms, 10 (33.33%) had moderate symptoms, and 5 (16.67%) had severe symptoms.

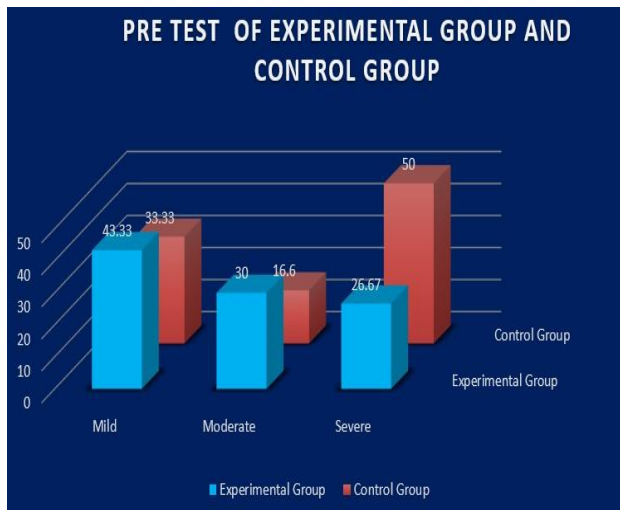


Figure 1 shows the prevalence of muscular cramps among patients in the experimental and control groups at the time of the pretest.

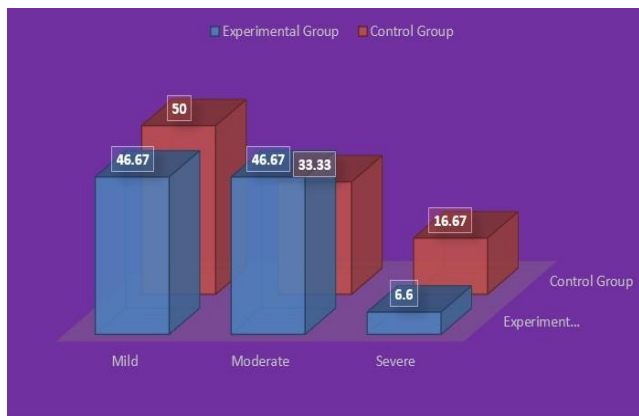
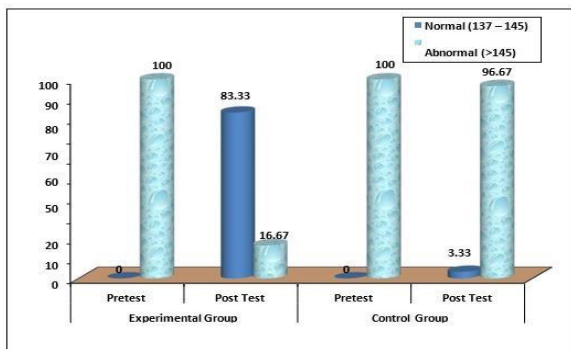


Figure 2: Percentage distribution of post test of muscle cramps among patient in the experimental and control group

Section B: 2 Evaluation of The Levels Of Biomarkers (Sodium And Potassium) In The Experimental And Control Groups Before And After The Test.

results showed that in the experimental group's pretest, 30 (100%) had abnormal sodium levels, while in the group's posttest, 25 (83.33%) had normal ranges and 5 (16.67%) had abnormal levels. Additionally, it demonstrates that the control group's pretest sodium levels were 30 (100%) abnormal, whereas the group's posttest sodium levels were 29 (96.67%) abnormal and 1 (3.33%) normal.

Level of Sodium	Experimental Group				Control Group			
	Pretest		Post Test		Pretest		Post Test	
	F	%	F	%	F	%	F	%
Normal (137 – 145)	0	0	25	83.33	0	0	1	3.33
Abnormal (>145)	30	100.0	5	16.67	30	100.0	29	96.67



Comparison of the level of muscle cramps and biomarkers among patients between the experimental and control groups is shown in Section C.

Effectiveness of intra-dialytic stretching exercises among patients receiving hemodialysis is shown in Table 4.

Stain Intensity	Mean	S. D	Paired 't' test Value
Pretest	1.83	0.83	t = 9.104 p = 0.0001 S***
Post Test	0.73	0.69	

***p<0.001, S – Significant

The pretest mean score was 1.83 with a 0.83 standard deviation, and the posttest mean score was 0.73 with a 0.69 standard deviation, according to Table 4. At the p0.001 level, it was determined that the computed paired "t" test value of t = 9.104 was

statistically highly significant. This implies without a doubt that the post-test degree of muscular cramps among haemodialysis patients in the experimental group significantly decreased.

Section D: Association of Selected Demographic Variables with The Post Test Level Of Muscle Cramps And Selected Bio Markers Among Clients Undergoing Hemodialysis.

The study demonstrates that demographic factors including age, the type of job one does, dietary habits, the severity of renal failure, and the length of dialysis therapy significantly correlate with the degree of muscular cramps experienced after a test.

4. Conclusion

The majority of those receiving hemodialysis exhibited high amounts of biomarker alterations, according to the study's findings. Intradialytic stretching exercises were administered, and it was discovered that there had been a high degree of biomarker alteration. Intradialytic stretching exercise is a successful way to lessen muscle cramps and maintain the level of biomarkers among patients receiving hemodialysis. Participants reported

comfort and pleasure with its delivery.

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