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Effect of intradialytic exercise on fatigue among patients undergoing hemodialysis at selected hospital, Coimbatore

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Abstract

The study was to assess the effect of intradialytic exercise on fatigue among patients undergoing hemodialysis at selected hospital, Coimbatore. Non randomized quasi experimental pretest- posttest control group design was adopted in this study. By using purposive sampling technique 34 samples were selected in both experimental and control group. Intradialytic exercises were demonstrated to the patients and continued to practice for four weeks during hemodialysis. The duration of total exercise was 15 minutes performed after the first hour of hemodialysis. At the end of four weeks, post test was done using Iowa fatigue scale. The result shows that there was a significant difference in the level of fatigue among experimental and control group after intradialytic exercise ($t=6.88, p=0.001$). There was a significance difference in the level of fatigue in experimental group before and after intradialytic exercise ($t=12.58, p=0.001$). Hence, it was concluded that intradialytic exercise is an effective intervention in reducing the level of fatigue among patients undergoing hemodialysis.

Keywords: intradialytic exercise, fatigue

Introduction

The quality led by a human being is influenced by his physical well-being. Physical well-being depends upon the accurate balance of components like fluids, solutes and some waste materials.

The worldwide population of people affected by chronic kidney disease is around 10% and millions of people die every year because of cost intensive treatment. Over two million people worldwide receive treatment with dialysis or a kidney transplant. Chronic kidney disease was ranked 18th in the list of causes of total number of deaths worldwide in 2010. Among people aged 65 to 74 worldwide, it is estimated that one in five men, and one in four women, have chronic renal failure.

Hemodialysis is the process of artificially removing waste and excess water from the blood in people suffering from chronic kidney failure. (The Times of India, 2014). Fatigue is a debilitating symptom or side effect experienced by patients on long-term dialysis therapy.

Intradialytic exercise is known to improve mental and physical functioning of the body and to improve quality of life. There are different exercise like flexibility exercises and strengthening exercises to improve the physical functioning of the patient. Intra dialytic exercise which are performed during the hemodialysis procedure is given for 15 minutes on each cycle for one month. (Peter, 2012). Intra dialytic Exercise improve the muscle protein synthesis and breakdown, reduces fatigue and improves strength and overall function of the body.

Need for the Study

Indians suffering from kidney ailments has doubled in the past 15 years, and at present 17 in every hundred citizens suffer from some type of kidney disease. Around 150-230 persons suffer from chronic renal failure in every million people, and about 2, 20,000-2, 75,000 new patients need hemodialysis, peritoneal dialysis or renal transplantation every year. The number of patients undergoing dialysis in India is also increasing by 10-15 per cent every year. (Indo-Asian News Service, 2016).

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The prevalence of fatigue ranges from 60% to 97% in patients on long-term renal replacement therapy. The importance of fatigue to patients with kidney disease is underscored that 94% of hemodialysis patients willing to undergo regular dialysis if there is an associated increase in energy level. (Jung & park, 2011).

Intra dialytic exercise improves exercise adoption and adherence, it is performed safely, and is feasible to administer. Moreover, intra dialytic exercise can improve solute removal, hemodialysis adequacy, intra dialytic protein synthesis, muscular strength, peak oxygen consumption, nutritional status and quality of life. There are currently no policies or position stands regarding exercise prescription for hemodialysis patients. (Cheema, Smith & Singh, 2009).

Statement of the Problem

Effect of Intra dialytic Exercise on Fatigue among Patients undergoing Hemodialysis at Selected Hospital, Coimbatore.

Objectives

1. To assess the level of fatigue among patients undergoing haemodialysis.
2. To evaluate the effect of intradialytic exercises on fatigue among patients undergoing haemodialysis.
3. To associate the level of fatigue with selected demographic variables among patients undergoing haemodialysis.

Methods and materials research design

Quantitative research approach was adopted for the study with Non randomized quasi experimental pretest-posttest control group design. The study was conducted in dialysis unit of selected Hospital Coimbatore. A total of 34 patients undergoing hemodialysis were selected for the study using Non probability-Purposive sampling technique in both experimental and control group. The independent variable is intradialytic exercise and dependent variable is the level of fatigue. Intradialytic exercises were given only to the experimental group and the control group received routine treatment.

Demographic data consists of age, gender, educational status, occupation, monthly income, onset of renal failure,

duration of hemodialysis treatment, any other associated illness and number of cycles. Biochemical parameters consists of blood sugar, blood urea, serum creatinine, serum potassium and hemoglobin assessed at day one and day 30. Physiological parameters include blood pressure before and after hemodialysis. Ethical consent was obtained from the institutional ethical committee. Written consent was obtained from each study participants.

Intra dialytic Exercises were performed after the first hour of hemodialysis. Each exercise must be performed for one minute and totally for 14 minutes for 14 exercises. On the First day seven exercise were taught and then gradually increased to fourteen exercises based on the tolerance of the patients. The level of fatigue using Iowa fatigue assessment scale for both experimental and control group was assessed before and after Intradialytic exercise.

Criteria for sample selection

The samples were selected based on the following inclusion and exclusion criteria.

Inclusion criteria

1. Patients who are alert and cooperative.
2. Patients who are undergoing hemodialysis for two or more cycles in a week.
3. Patients who are willing to participate in this study.
4. Patients who are regularly coming for hemodialysis.
5. Patients who are undergoing hemodialysis for more than one year.
6. Patients who are undergoing hemodialysis for monday, wednesday and friday are considered as experimental group and rest of the days in control group.

Exclusion criteria

1. Patients who are critically ill.
2. Patients with musculoskeletal deformities.
3. Patients with diabetic foot or burns injury.
4. Patients who are undergoing emergency hemodialysis and first hemodialysis.
5. Patients with femoral and jugular dialysis.

Data analysis and interpretation

Table 1: Demographic variables of patients undergoing hemodialysis.

Socio Demographic variables	Experimental group (n=20)		Control group (n=14)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Age (in years)				
21-35	4	20	2	14.28
36-50	4	20	2	14.28
51-65	9	45	7	50
>65	3	15	3	21.44
Gender				
Male	14	70	11	78.57
Female	6	30	3	21.43
Education				
Illiterate	3	15	2	14.28
Primary school	1	5	2	14.28
Middle school	4	20	4	28.57
High School	6	30	1	7.15
Higher secondary and above	6	30	5	35.72
Occupational Status				
Employed				
Unemployed	5	25	4	28.57
Monthly	15	75	10	71.43

Income (in Rupees)				
<5000	4	20	1	7.14
5001-10,000	3	15	1	7.14
10,001-15,000	6	30	4	28.58
> 15,000	7	35	8	57.14
Duration of Hemodialysis treatment (in years)				
<5 years	18	90	12	85.71
>5 years	2	10	2	14.29
Number of hemodialysis Cycles per week				
2 Cycles	18	90	8	57.14
3 Cycles	2	10	6	42.86

Age group of patients undergoing hemodialysis revealed that, majority of patients were between the age group of 51-65 years in experimental group 9(45%) and control group 7(50%) respectively.

Gender of patients undergoing hemodialysis revealed that, among 34 patients, majority of patients were males in both experimental group 14(70%) and control group 11(78.57%) respectively.

Educational status of patients undergoing hemodialysis revealed that, in the experimental group 6(30%) patients had high school education and higher secondary and above education respectively. In the control group 5(35.72%) had higher secondary and above education.

Occupational status of patients undergoing hemo dialysis revealed that, 15(75%) in experimental group and 10(71.43%) in control group were unemployed.

Monthly income of patients undergoing hemodialysis revealed that, 7(35%) patients from experimental group and 8(57.14%) patients from control group are getting their monthly income above 15,000.

Duration of hemodialysis treatment of patients undergoing hemodialysis revealed that, majority of patients 18(90%) in experimental group and 12(85.71%) in control group undergo hemodialysis for less than 5 years.

Associated illness of patients undergoing hemodialysis revealed that, majority of patients 20(100%) in experimental group and 13(92.86%) in control group had associated illness.

Number of hemodialysis cycles of patients undergoing hemodialysis revealed that, majority of patients 18(90%) in experimental group and 8(57.14%) in control group undergo 2 cycles a week.

Table 2: Comparison on the Level of Fatigue among Patients undergoing Hemodialysis

S. No	Level of Fatigue	Experimental group (n=20)				Control group (n=14)			
		Pre test		Post test		Pre test		Post test	
		Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
1	Pre test		38.5		4.35		7.55		12.58***
2	Post test		30.95		4.15				

The table. 2 shows that the level of fatigue in the pretest of experimental group shows that, 10 patients had fatigue (30-39), and in the control group 7 patients had fatigue (30-39) and severe fatigue (40-55). In the post test of experimental

group 12 patients had fatigue (30-39) and in the control group 10 patients had severe fatigue (40-55). In the control group 7(50%) patients had severe fatigue and in post test it was increased to 10(71.43%) patients had severe fatigue.

Table 3: Analysis on the effect of intradialytic exercise on level of fatigue among patients undergoing hemodialysis in experimental group

S. No	Observation	Mean	SD	Mean difference	Calculated 't' value
1	Pre test	38.5	4.35		
				7.55	12.58***
2	Post test	30.95	4.15		

*** Significant at 0.001 level

The table 3 shows that, the mean level of fatigue among patients during pre-test and post-test in the experimental group was 38.5 and 30.95 respectively with a mean difference of 0.20. Likewise the standard deviation of pretest and post test was 4.35 and 4.15 respectively. The calculated 't' value 12.58 was greater than the table value of 3.88 at 0.001 level of significance. Hence there is a significant difference in pretest and post test of experimental group. Hence the research hypothesis was accepted.

Major findings

Age and educational status had significant association with

level of fatigue at 0.05 level of significance and associated illness had association at 0.001 level of significance.

There is no significant difference on the level of Biochemical Variables among experimental group and control group before and after Intradialytic Exercise.

There is significant difference in systolic blood pressure before and after hemodialysis in experimental group at 't' value 4.28 significant at 0.001 level and diastolic blood pressure before and after hemodialysis in experimental group at 't' value 2.3 significant at 0.05 level.

The mean pretest and post-test level of fatigue was reduced from 38.5 and 30.95 after administration of Intradialytic

Exercise in experimental group with a calculated 't' value is 12.58 which was greater than the table value. Hence Intradialytic exercise is effective in experimental group than the control group.

There is significant association with the level of fatigue among patients undergoing hemodialysis on age ($\chi^2=13.73$) and educational status ($\chi^2=16.50$) at 0.05 level of significance and associated illness ($\chi^2=11.627$) had association at 0.005 level of significance.

Recommendations

1. Replication of the study could be done with larger samples to validate and generalize the findings.
2. Staff nurses have to be trained to implement intradialytic exercise during hemodialysis to reduce the level of fatigue
3. Intradialytic Exercise can be performed by patients undergoing hemodialysis.
4. It can be implemented to acute and chronic centers for renal patients.
5. The study can be focused on patients with newly diagnosed to identify the severity of fatigue.

Conclusion

Hemodialysis is the treatment of choice for the majority of patients with chronic renal failure. Fatigue is one of the most frequent complaints of dialysis patients and is associated with impaired health-related quality of life. Fatigue is a subjective sense of weakness, lack of energy, and tiredness.

Intradialytic exercise has been shown benefits on the potential improvements on cardiovascular outcomes, dialysis efficacy, physical function and health-related quality of life. Intradialytic exercise increase exercise tolerance, overall functional status of the motor system and maintain blood pressure. Intradialytic exercise is known to improve mental and physical functioning and to improve quality of life. It improves the muscle protein synthesis and breakdown, which determining both strength and overall function of the body and reduces fatigue. Intradialytic exercise are safe, effective, time consuming and can be performed in day to day practices without any expenses.

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