



**ORIGINAL RESEARCH PAPER**

**Nephrology**

**EFFECT OF INTRADIALYTIC EXERCISES ON CLINICAL OUTCOME AMONG PATIENTS UNDERGOING MAINTENANCE HEMODIALYSIS**

**KEY WORDS:** Intradialytic exercises; Clinical outcome; maintenance hemodialysis; Pittsburgh sleep quality index; urea reduction ratio.

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**ABSTRACT**

**Background-** Although it is widely accepted that exercise is beneficial in patients with end-stage renal disease as in the general population, it is not easy to incorporate exercise programs into routine clinical practice. **objectives:** To determine the effect of intradialytic exercises on clinical outcome among patients undergoing maintenance hemodialysis and to find the association of clinical outcome with selected socio personal and clinical variables. **Material and Method:** One group pretest posttest design carried out among 30 patients who fulfilled the selection criteria were consecutively selected from dialysis unit of a tertiary care unit. The tools used were socio personal and clinical data sheet, Urea reduction ratio sheet, Pittsburgh sleep quality index, fatigue severity rating scale and muscle cramp assessment tool. **Results:** After intradialytic exercises urea reduction ratio was improved significantly from  $64.27 \pm 9.10$  to  $68.47 \pm 7.33$ , Pittsburgh sleep quality index score decreased significantly from  $10.40 \pm 4.17$  to  $8.43 \pm 4.67$ , fatigue severity score decreased significantly from  $43.03 \pm 15.14$  to  $28.93 \pm 16.56$  and muscle cramp severity score significantly decreased from  $2.13 \pm 1.33$  to  $1.77 \pm 1.35$ . Intradialytic exercises were found to be effective in improving clinical outcome of patients undergoing maintenance hemodialysis. No statistically significant association was found between clinical outcome of dialysis and selected socio personal and clinical variables.

**INTRODUCTION**

The burden of chronic kidney diseases is increasing in alarming proportion all over the world. Kidneys are probably the only vital organ which can be realistically replaced by artificial means. Maintenance dialysis is a well-recognized modality of treating patients having end stage renal disease.<sup>1</sup>

According to national kidney foundation 10% of the population worldwide is affected by chronic kidney disease (CKD), and millions die each year because they do not have access to affordable treatment<sup>2</sup>. Yearly incidence of ESRD in India is approximately 150–200 (pmp) and DM is an important cause of CKD in approximately 30–40 % of the patient<sup>3</sup>.

During the clinical experience of the investigator in dialysis unit of a tertiary care hospital, observed that many of patients experiencing problems such as muscle cramps, fatigue, hypotension, poor sleep quality, joint pain, anxiety, depression, difficulty to attend social functions. Fatigue has been identified as a distressing and disabling symptom that interferes their ability to enjoy life and to take care of themselves. Poor sleep quality is a very common problem in dialysis patients. Hemodialysis patients are susceptible to muscle cramps<sup>4</sup>. These are often very painful, disruptive to dialysis management. Since cramps are a common intradialytic event, the discomfort leads to premature termination of the treatment, noncompliance with the prescription. Stretching exercises may be the best measure to reduce or prevent cramps.

Therefore, the aim of this study is to implement an exercise intervention during dialysis and determine its effect on clinical outcome such as urea reduction ratio, fatigue severity, sleep quality and muscle cramps severity among patients undergoing maintenance hemodialysis.

**TOOLS AND TECHNIQUE**

The technique used for the data collection were interview and self-reporting.

- Tool I: Semi structured interview schedule to assess socio – personal data and clinical data of patients undergoing maintenance hemodialysis
- Tool II: It consists of 4 sections

Tool II A: Urea reduction ratio sheet

Tool II B: Pittsburgh Sleep Quality Index

Tool II C: Fatigue severity rating scale

Tool II D: Muscle cramps severity assessment tool

Content validity index obtained for the tool I was 0.92 and for tool II B, tool II C, tool II D were 1, 0.91, 0.92 respectively and reliability of tool were assessed using Cronbach's alpha and was calculated as 0.87, 0.86 and 0.83 for tool I, tool II C, tool II D respectively which showed the tool was reliable.

**MATERIAL AND METHOD**

Pre experimental, one group pretest posttest study conducted among 30 patients undergoing maintenance hemodialysis in a tertiary care hospital, to evaluate the effect of intradialytic exercise on clinical outcome. Data collection started after getting permission from hospital administrative board. Data collection period was from 01-02-2016 to 30-03-2016. Patients undergoing maintenance hemodialysis were selected as per inclusion criteria, a written consent was taken from them. Pretest was done for a period of one month (01-02-2016 to 27-02-2016). Initially socio personal and clinical data were collected. Muscle cramp severity was assessed during each dialysis session. Urea reduction ratio was measured on 1st and 8th dialysis sessions of pre interventional period. For that blood is drawn before initiating dialysis and after the completion of dialysis session. Then fatigue severity rating scale and Pittsburgh sleep quality index (PSQI) was administered on the last week of that month. Intradialytic exercises were taught to the subjects by the investigator through discussion and demonstration. Patients were given opportunity to clear their doubts. The patients were asked to practice the exercises after demonstration by the investigator. They practiced the exercises during the first two hour of dialysis session for a period of one month. Posttest was done from the period of 29/02/2016 to 26/03/2016. Patients were observed for the occurrence of muscle cramps during the session. Then urea reduction ratio was measured 2 times on 9th and 16th dialysis session of interventional period. Fatigue severity and PSQI were administered on the last week (21/03/16 to 26/03/16) of interventional period

**RESULT**

Nearly half (44%) of patients participated in the study were belonged to the age group of 41-50 years with a mean age of  $47.23 \pm 7.15$ . Among 30 patients 60% were females. Majority (94%) of patients had school education and 83.3% were unemployed. 80% of patients were belonged to BPL category, and 63.3% of patients 80 had RSBY and chis plus insurance coverage. Among the 30 patients 53% of patients had

hypertension as preexisting comorbidity, 7 % of patients had diabetes and 23% of patients had hypertension and diabetes. Results shows that after intradialytic exercises urea reduction ratio was improved significantly from  $64.27 \pm 9.10$  to  $68.47 \pm 7.33$ (Table-1), Pittsburgh sleep quality index score decreased significantly from  $10.40 \pm 4.17$  to  $8.43 \pm 4.67$ (Table-2), fatigue severity score decreased significantly from  $43.03 \pm 15.14$  to  $28.93 \pm 16.56$  and muscle cramp severity score significantly decreased from  $2.13 \pm 1.33$  to  $1.77 \pm 1.35$  (Table-3). Intradialytic exercises were found to be effective in improving clinical outcome of patients undergoing maintenance hemodialysis. No statistically significant association was found between clinical outcome of dialysis and selected socio personal and clinical variables.

**Table:1 Mean, SD and t value of Urea reduction ratio among patients undergoing MHD before and after intradialytic exercises**

(n=30)						
Urea reduction ratio	Mean	SD	Mean difference	df	t value	p value
Before intradialytic exercises	64.27	9.1	4.2	29	2.63	0.014
After Intradialytic exercise	68.47	7.33				

\*0.05 level of significance

**Table:2 Mean, mean difference, SD and t value of Pittsburgh sleep quality index before and after intradialytic exercises among patients undergoing MHD**

(n=30)						
Sleep quality index	Mean	SD	Mean difference	df	t value	p value
Before intradialytic exercises	10.4	4.7	1.96	29	2.2	0.036
After intradialytic exercises	8.43	4.67				

\*0.05 level of significance

**Table: 3 Frequency distribution and percentage of patients undergoing maintenance hemodialysis based on their clinical outcome before and after the intradialytic exercises**

(n=30)				
Clinical outcome	Before intradialytic exercises		After intradialytic exercises	
	f	%	f	%
<b>URR</b>				
<65%	14	47	9	30
≥65%	16	53	21	70
<b>PSQI</b>				
Good sleep	5	17	10	33.3
Poor sleep	25	83	20	66.7
<b>Fatigue Severity</b>				
Mild	6	20	17	56.7
Moderate	14	47	7	23.3
Severe	10	33	6	20
<b>Muscle cramp Severity</b>				
No cramps	06	20	09	30.0
Mild	08	27	08	26.7
Moderate	16	53	13	43.3

**CONCLUSIONS**

Intradialytic exercises were very effective to improve the clinical outcome among patients undergoing maintenance hemodialysis. The nurses are playing important role as health advisors and change agents, they can encourage the patients to practice this exercises during dialysis session to improve the adequacy of dialysis which in turn leads to better clinical outcome. Much emphasis has to be given in nursing

curriculum regarding non-pharmacological measures and their effective use in nursing field. Staff and students should be provided with proper guidance in the usage of intradialytic exercises and should be made aware about the benefits and guidelines for the same.

**RECOMMENDATIONS**

Keeping in view of the findings of present study, a similar study can be conducted in a larger sample by using random sampling, similar study can be done with multiple time series design and a comparative study can be done to find out the difference between active and passive intradialytic exercises among patients undergoing maintenance hemodialysis.

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**ETHICAL ISSUES**

Individual consent was taken from all participants during the study.

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