

EFFECT OF INTRADIALYTIC EXERCISES ON QUALITY OF LIFE IN OLDER HEMODIALYSIS PATIENTS

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ABSTRACT

Background: The largest growth in individuals requiring treatment for End Stage Renal Disease (ESRD) is among older persons. Older hemodialysis patients have numerous co morbidities & complications from ESRD that limit exercise tolerance, reduce physical capacity & increase functional impairments. This study will provide an evidence of positive effects of intradialytic exercise & improvement of Quality of Life (QOL) of older hemodialysis patient.

Objective: To study the effects of intradialytic exercise on QOL of older hemodialysis patients.
Methods: 43 patients with ESRD, both the genders, who consecutively is on hemodialysis treatment satisfying both the inclusion and exclusion criteria were selected. Their exercise Tolerance Capacity was evaluated by 6 minute Walk Test (MWT) & the QOL was assessed & recorded by using KDQOL Questionnaire pre & post to the exercise intervention. Data was analysed using the paired t test.

Results: This study concludes that there is significant effect of intradialytic exercise on QOL of hemodialysis of older patients.

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INTRODUCTION

Dialysis is always regarded as the only supportive measure in those for whom kidney transplant would be in appropriate. Dialysis is used to provide an artificial replacement for kidney failure patients & by which these toxins in blood can be cleared away to a large extent.

The largest growth in individuals requiring treatment for end stage renal disease [ESRD] is among older persons.¹ Older Hemodialysis(HD) patients have numerous co morbidities & complications from ESRD that limit exercise tolerance, reduce physical capacity & increase functional impairments.²

In recent years, advancements in dialysis technology have enabled dialysis patients to receive long term treatment. Although the elderly population is increasing, the number of patients with chronic disease is declining. However, the number of elderly patients undergoing maintenance dialysis as well as the number of patients who require assistance with activities of daily living (ADL) due to a decline in physical function is increasing. Therefore, renal rehabilitation has been proposed as a new method to address these issues.

Renal rehabilitation aims to alleviate symptoms, maintain/promote physical fitness & health, reduce mental burdens & improve the quality of life (QOL). This is

implemented through exercise therapy, which has been shown to be effective in improving patient exercise tolerance & QOL.

Exercise training in young HD patients has been shown to result in improvements in exercise & functional capacity³ & quality of life⁴. Despite the reported benefits of exercise, older HD patients tend to demonstrate low levels of participation or interest in exercise programs⁵. This study will provide an evidence of positive effects of intradialytic exercise & improvement of QOL of older hemodialysis patient.

Need for Study

An exercise during dialysis has shown its potential for removal of uremic toxins as well as positive effects on patient's mental & physical health. Patients on dialysis are often associated with lower quality of life & are dependent on others. Hence, direct improvement in patient condition will be seen. Simplified ROM exercises for lower limb has increased the efficacy of dialysis & effective modality for hemodialysis patients.

Co morbid medical conditions are common in ESRD patients & are important contributing factors to clinical outcomes. Thereby, obtaining the maximal possible overall wellness to the patients.

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Aims and Objectives

Aim of the study

To study the effect of intradialytic exercise on Quality of Life of older hemodialysis patients.

Objectives of the study

1. To find the effect of intradialytic exercise on quality of life in Hemodialysis patient.
2. To compare the effect of exercise during dialysis on patient's Physical composite score & Mental composite score.

METHODOLOGY

Type of study: Correlational study.

Sampling method: Purposive sampling method.

Sample size : 43 patients.

Place of study : MIP Physiotherapy Department, YCR Hospital, Latur.

Duration of study: 4weeks.

Inclusion criteria

- ✓ Both male and female of elderly patients of 50 years of age & above
- ✓ Minimum haemoglobin level of 10g/dL.
- ✓ Desirable performance in 6 minute walk test. (MWT)
- ✓ Minimum dialysis vintage of 2 Months.

Exclusion criteria

- ✓ History of recovering or persistent Hypotension in the past 2 months.
- ✓ Severely Hypertension patients.
- ✓ Anemic patients.
- ✓ History of known Arrhythmia.
- ✓ Patients with end stage organ disease e.g. COPD
- ✓ Moderate to severe osteoarthritis of knee

Material

- B.P Apparatus,
- stethoscope,
- Stop watch,
- 2 Cones for marking, Chair.
- Weight cuffs(1/2 KG & 1 KG),
- Pedocycle.

Procedure

43 patients with end stage renal disease, who consecutively on hemodialysis treatment were selected for study. Informed consent has been taken from all the patients. The consented patients will be called for 6 minute walk test (MWT), before including in the study. All vitals was assessed before and after the test.

The patients undergoing maintenance dialysis, who had difficulty in developing exercise habits, received intra dialysis exercise for 6 weeks. The exercise was initiated one hour after start of dialysis session.

The exercise session includes

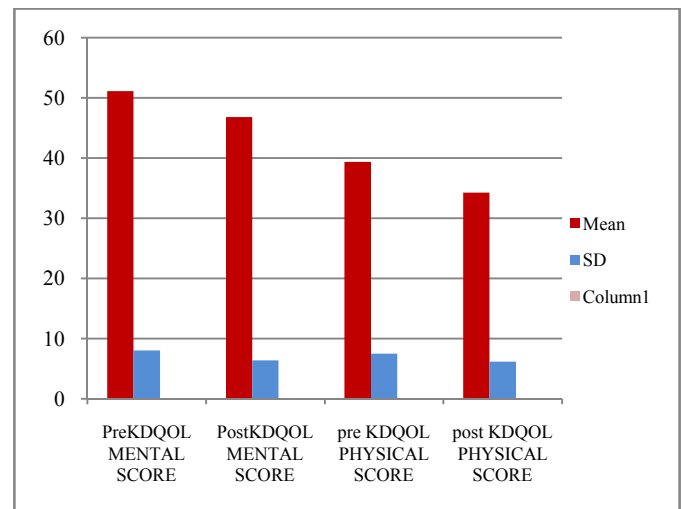
- 1.Warm up [5 Min]
- 2.Lower limb strengthening [10 min]
- 3.Aerobic exercise [20 min]

4.Cool down [5 min]

Their physical composite scores and mental composite score of QOL, was evaluated before and after intervention by using kidney disease QOL questionnaire which is take in recorded.

Table 1 Distribution of score obtained by study patients.

		Paired samples statistics		
		mean	N	Std. deviation
Pair 1	Pre KDQOL MENTAL SCORE	51.0930	43	8.02916
	post KDQOL MENTAL SCORE	46.8140	43	6.38546
Pair2	pre KDQOL PHYSICAL SCORE	39.3721	43	7.51514
	post KDQOL PHYSICAL SCORE	34.2558	43	6.16863



Graph 1

RESULT

45 patients were assessed for study eligibility, 43 were enrolled & 2 was withdrawn for toothache, headache prior to the initiation of the program. The mean (SD) age of the 43 participants was 61.5 years, (18 aged 50-60; 19 aged 61-65, 3 aged 66-10, 3 aged 71-75); 31 were male and 12 were female.

Participation and cooperation in the patients for exercise program was high. The reasons for not exercising were symptoms prior to with initiation of exercise (eg. Leg cramps, nausea, shivering with cold, unstable blood pressure).

There was significant difference noted pre & post treatment on mental health of the study patients who underwent intradialytic exercise via KDQOL score at p<0.05 as depicted in table 1 & graph no. 1

There was significant difference noted pre & post treatment on physical health of the study patients who underwent intradialytic exercise via KDQOL score at p<0.05 as depicted in table 1. & graph no. 1

DISCUSION

Currently, the number of elderly patients undergoing maintenance dialysis is creasing & issues involving the maintenance of motor functions, ADL ability, & QOL need to be addressed. This study examined the potential of exercise therapy during dialysis, which was performed by physical therapist.

Participant in the in-hospital exercise program was high; patients exercised during all of their 12 physiotherapy

sessions. The high level of participation in intradialytic exercise in our study may be attributed to the following: our program supported the formal incorporation of exercise into the overall dialysis plan, signaling to patients & families that exercise is an important part of treatment; the exercise was individualized, supervised & incorporated patient's wishes & preferences; special equipment was provided that enabled patients to exercise in a reclined or supine position during HD, & exercise during dialysis provided a productive activity that did not require extra time.^{9,10}

Similar to our study, Pianta & Kutner¹¹ piloted an individualized exercise program with 25 older, low functioning patients. Only 48% of their patients regularly attended the exercise sessions. Their exercise program included physical therapy sessions outside patients HD sessions. This may have contributed to their lower participation level compared to our study that had patients exercise during their HD sessions.

The quality of life has been reported to improve through intervention¹². In this study, the QOL markedly varied between before & after intervention, indicating a favourable outcome. The values for the KDQOL components of physical health & mental health were significantly higher after intervention. These improvements may have been the result of patients developing a positive attitude toward physical activities.

It is important to note that dialysis patients who perform daily physical activities have a lower death risk compared with those who rarely exercise¹³. The Kt/v values have also been reported to improve through exercise during dialysis¹⁴.

In previous studies, exercises for patients with renal diseases or those requiring dialysis improved their exercise tolerance without negatively influencing their renal function, thereby enhancing dialysis efficacy¹⁵. Furthermore, the prognosis is more favorable for dialysis patients who habitually perform exercises compared with those who do not¹⁶. Based on these findings, dialysis patients are now being encouraged to actively exercise.

While the rate of continued exercise therapy is highest when performed during dialysis, training on non dialysis days under supervision has been reported to be the most effective for dialysis patients¹⁷. Therefore in the future, it may be necessary to develop programs to perform exercise therapy only on such days. In addition, as the elderly are subject to marked decline in antigravity muscle strength due to prolonged bedridden condition, the incorporation of muscle strength training in a Standing position should be considered.

Bibliography

1. Schaubel DI, Momison HI, Desmenles M, Parsons DA, Fenton SSA. End-stage renal disease in Canada: Prevalence projections to 2005. *Canadian Medical Association Journal*, 1999; 60:1557-1563. [PubMed: 10373996].
2. Kutner NG, Cardenas DD, Bower JD, Rehabilitation, aging and chronic renal disease, *American Journal of Physical Medicine & Rehabilitation*. 1992; 71:97-101. [PubMed: 15587401]
3. Painter P, Carlson L, Carey S, Paul SM, Myll J. Low-functioning hemodialysis patients improve with exercise training. *American Journal of Kidney Diseases*. 2000; 36:600-608. [PubMed: 10977793]
4. Painter P, Carlson L, Carey S, Paul SM, Myll J. Physical functioning and health-related quality-of life changes with exercise training in hemodialysis patients. *American Journal of Kidney Diseases*. 2000; 35:482-492. [PubMed: 10692275]
5. Conn VS. Older adults and exercise: Path analysis of self-efficacy related constructs. *Nursing Research*. 1998; 47:180-189. [PubMed: 9610652]
6. Maja Bucar Pajek. Six minute walk test in renal failure patients. 2016; 10:1371. [PLOS ONE: 0150414].
7. American College of Sports Medicine: ACSM's guidelines for exercise testing and prescription, 8th ed. Lippincott Williams & Wilkins/Wolters Kluwer Health, 2011.
8. Painter P, Moore GE: The impact of recombinant human erythropoietin on exercise capacity in hemodialysis patients. *Adv Ren Replace Ther*, 1994, 1: 55- 65 [PubMed: 17902035].
9. Kontos PC, Miller KL, Brooks D, Jassal SV, Spanjevic L, Devins GM, Souza MJ, Heck C, Laprade J, Naglie G. Factors influencing exercise participation by older adults requiring chronic hemodialysis: A qualitative study. *International Urology and Nephrology*. 2007; 39:1303-1311.[PubMed: 17902035].
10. Painter P, Carlson L, Carey S, Myll J, Paul S. Determinants of exercise encouragement practices in hemodialysis staff. *Nephrology Nursing Journal*. 2004; 31:67-74. [PubMed: 15008075].
11. Pianta TF, Kutner NG. Improving physical functioning in the elderly dialysis patient: Relevance of physical therapy. *American Nephrology Nurses Association Journal*. 1999; 26:11-21.
12. Bae YH, Lee SM, Jo JI: Aerobic training during hemodialysis improves body composition, muscle function, physical performance, and quality of life in chronic kidney disease patients. *J Phys Ther Sci*, 2015, 27: 1445-1449.
13. O'Hare AM, Tawney K, Bacchetti P, *et al.*: Decreased survival among sedentary patients undergoing dialysis: results from the dialysis morbidity and mortality study wave 2. *Am J Kidney Dis*, 2003, 41: 447-454.
14. Lo WK, Ho YW, Li CS, *et al.*: Effect of Kt/V on survival and clinical outcome in CAPD patients in a randomized prospective study. *Kidney Int*, 2003, 64:649-656.
15. Pechter U, Ots M, Mesikepp S, *et al.*: Beneficial effects of water-based exercise in patients with chronic kidney disease. *Int J Rehabil Res*, 2003, 26: 153-156.
16. Bae YH, Lee SM, Jo JI: Aerobic training during hemodialysis improves body composition, muscle function, physical performance, and quality of life in chronic kidney disease patients. *J Phys Ther Sci*, 2015, 27: 1445-1449.
17. Konstantinidou E, Koukouvou G, Kouidi E, *et al.*: Exercise training in patients with end-stage renal disease on hemodialysis: comparison of three rehabilitation programs. *J Rehabil Med*, 2002, 34: 40-45.