EXERCISE IN DIALYSIS PATIENTS

MEDigest

ISSUE #35: JULY 2024

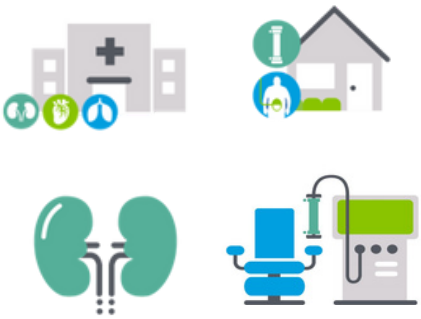
Photo from Canva

BENEFITS OF EXERCISE IN DIALYSIS PATIENTS

The first section of this newsletter will focus on effects of physical activity on dialysis patients and some clinical data indicating the benefits of integrating exercise in dialysis patients

STRATEGIES FOR INCORPORATING EXERCISE IN DIALYSIS PATIENTS

The second section will highlight strategies to incorporate exercise in daily life of dialysis patients and will also focus on some challenges faced for appropriate adoption in dialysis patients.



DISCLOSURE:

This material has been developed by the Fresenius Medical Care Global Medical Information and Education Office and Global Medical Office. It is intended to provide pertinent data to assist health care professionals in forming their own conclusions and making decisions and not intended to replace the judgement or experience of the attending physicians or other medical professionals. Any such use of drug or devices should not be considered an endorsement of any indication, dosage or other claim that is not covered, if applicable, in the label approved by your regulatory authority. The treatment prescription is the sole responsibility of the attending physician.

DISCLAIMERS:

Any external resources referred to in this material are provided for informational purposes only. The Fresenius Medical Care group of companies is not affiliated with, has no control over and does not endorse or approve such resources in any way and shall not be responsible for any losses or damages arising in connection with any use, reference and/or reliance of any resources.

All photography contained in this material is for illustrative purposes only, and all persons shown in photographs are licensed stock photography models and are not actual patients nor are they affiliated with the Fresenius Medical Care group or any patients. The Fresenius Medical Care group of companies assumes no liability whatsoever for any consequence relating to directly or indirectly to the use of the photographs showing the models in this material.

CONTACT US:

For suggestions and comments, please contact us via:

Medical_Information_Education@freseniusmedicalcare.com

Global Medical Education and Information,
Fresenius Medical Care Asia Pacific,
5105-5123 & 5141, 51/F Sun Hung Kai Centre,
30 Harbour Road, Wan Chai, Hong Kong

FRESENIUS MEDICAL CARE

BENEFITS OF EXERCISE IN DIALYSIS PATIENTS

Introduction

Care for dialysis patients has traditionally been focused on medical management of dialysis adequacy, fluid management, and laboratory parameters (1). However, patients often have other priorities such as reducing intolerance to hemodialysis (HD), interdialytic symptoms and other indications associated with end-stage kidney disease (ESKD) (1,2). To overcome these symptoms, chronic kidney disease (CKD) patients, and Healthcare Providers (HCPs) are actively seeking effective treatments with minimal side effects. Over the years, there has been growing evidence that a workout regimen can offer substantial advantages regarding physical, heart, and nutritional health, as well as overall well-being in CKD patients (3). Engaging in habitual physical activity and exercise has been associated with overall physical and mental well-being. Regular exercise has also been related to delayed mortality while also resulting in lower chances of developing cardiovascular risk factors, such as high blood pressure, diabetes, stroke, and other chronic diseases (4).

CKD patients experience high symptom burden, impaired physical function, and decreased physical activity levels that have been associated with reduced quality of life (QoL), increased all-cause mortality, and a higher risk of rapid decline in renal function. Physical exercise can help improve the QoL by alleviating symptoms in short term and benefitting the patient outcome via disease progression (5).

- Improves muscle strength (9)
- Improved RLS (6)
- Better blood pressure control (7)
- Decreased hospitalization (6)
- Better sleep (6,7)

Figure 1: Examples of potential advantages of exercise in dialysis patients. RLS: Restless Leg Syndrome.

Exercise can manage CKD symptoms

Exercise is an effective alternative therapy for managing CKD symptoms and may improve uremic Restless Leg syndrome (RLS), poor sleep, depression, and QoL significantly (2).

In a Randomized Controlled Trial (RCT) with 24 HD patients, the progressive exercise group (n=12) showed a significant decline (58%) in RLS symptoms (p=0.003) compared to no significant change in the control group (n=12; 17% change; p=0.124). After 6 months, progressive exercise group indicated better daily sleep (p=0.05), depression score (p=0.002) and RLS severity (p=0.017) than the control group (6).

In another 8-week RCT with 20 patients, Yoga (n=8) showed an improvement in sleep duration (7 vs 6.28; p=0.0001) and blood pressure (125.5 vs 131.13; p=0.002) compared to the control group (n=10) (7).

Furthermore, the role of home exercise was investigated in an Italian RCT, EXerCise Introduction to Enhance Performance in Dialysis (EXCITE) (n=227). This study investigated if exercise could improve physical performance and the QoL, and reduce the composite end points (mortality, cardiovascular events and hospitalizations) in dialysis patients. It showed that an increase of 20 walked meters during a 6-minute walking test (6MWT) on non dialysis days was associated with a 6% reduction risk in composite end points (p=0.001). Reduction in individual end points was also observed: all cause mortality and hospitalization by 12% (p<0.001), and 4% respectively (p=0.002) (8).

A recent multicenter German RCT, Dialysis Training Therapy (DiaTT), with a total of 917 patients used a change in 60 second sit to stand (STS-60) test to evaluate the lower body strength in exercise group (n=446) vs the control group (n=471) after a 12-month follow up. The STS-60 improved in exercise group (16 to 19) while decreased in control group (16 to 15) [p<0.001]. Moreover, the exercise group spent less days in the hospital per year vs the control group (2 vs 5; p=0.036) (9).

STRATEGIES FOR INCORPORATING EXERCISE IN DIALYSIS PATIENTS

Physical activities are crucial for dialysis patients to improve their physical function, muscle mass, and strength (10). Exercise interventions can be provided to patients while they are receiving dialysis using a cycling machine that is either fitted into the dialysis bed, appropriately attached to a chair or recommended for use at home. Exercise can be classified as either aerobic (walking or cycling during dialysis) or resistance (weightlifting, stretching elastic bands), and other treatments that can be done at home or during HD (11).

Exercise plans are determined and supervised by the treating physician, considering the type of activity, the person's level of physical fitness, and the frequency, intensity, and duration of exercise training. All these factors must be considered when trying to reach the goal with regular exercise training or rehabilitation (3). Table 1 summarizes recommendations and clinical guidelines (13) for physical activities for CKD patients.

Challenges and gaps

Although substantial evidence supports the benefits of physical activity for CKD patients, several obstacles exist to engaging in regular exercise such as physiological, physical, psychological, and structural (lack of access to programs or family support for exercise) (10).

Some of the barriers reported by a survey conducted in Canada on 423 HD patients include patients feeling too tired or weak, with some having shortness of breath, arthritis pain, chest pain, and depression. Other reasons included that patients couldn't afford the program, some did not know what exercise is safe and some couldn't travel (12).

Additionally, professionals such as physiotherapists who can help motivate patients and establish an exercise regime are limited as a part of kidney care team. Nurses, who help the most with patients exercise are often overloaded with work and and don't feel comfortable in prescribing and monitoring these exercise programs (1).

It is also important to recognize that resources may always be limited. Therefore to advocate the integration of exercise professionals into kidney care teams, there is a need to analyze their cost benefits (14).

Apart from that there are some gaps in the available evidence such as the overall effect of patient morbidity and quantifying the effect of exercise (1).

Hence more robust trials are needed to support the benefits of exercise programs and the cost benefits of exercise professionals or staff for better management.

Patients	Recommended exercise	Potential benefits	Precautions
Hemodialysis patients	If no contraindications, 150 mins of moderate intensity activity/week or; 75 mins of vigorous activity/week or; a mix of both	Reduce CV risk, all cause mortality, control BP, improve muscle strength, reduce hospitalization, improves dialysis efficiency	Observe contraindications in unstable patients; monitor and document symptoms during exercise
Transplantation patients	If no contraindications, 150 mins of moderate to vigorous exercise/week or; 75 mins of vigorous exercise/week; 3 times/week; structured exercise to enhance cardiorespiratory fitness and QoL.	Reduce CV and all-cause mortality	Avoid contact sports such as rugby, football, martial arts, and boxing, or prolonged exercise like marathons; avoid use of sport-enhancing supplements
Non-dialysis CKD patients	If no contraindication, 150 mins of moderate-intensity aerobic activity/week at least 2 days/week or; 75 mins of vigorous exercise/week or; a mix of both	Improve mental well-being, physical function, and capacity, health-related QoL, BP	Observe contraindications in unstable patients; monitor and document symptoms during exercise

Table 1: Clinical guidelines for exercise in CKD patients. Moderate intensity exercise: 12-14 on the Borg Rate of perceived exertion (RPE) scale (unit of measuring exercise strength) such as brisk walking or cycling; vigorous exercise such as running, aerobics (13)

References:

1. Borkum M et al. *Canad J Kid Health Dis.* 2024;11 :1-7.PubMed.
2. Song YY et al. *J Pain Symptom Manage.* 2018;55(4):1184-1195.PubMed.
3. Heiwe S et al. *Cochrane Database Sys Rev* 2011;CD003236. PubMed.
4. Garber CE et al. *Med Sci Sports Exerc* 2011;43(7):1334-59. PubMed.
5. Morishita S et al. *Hemodial Int.* 2017;21(4):483-89. PubMed.
6. Giannaki CD et. al. *Nephrol Dial Trans.* 2013;28:2834-2840. PubMed.
7. Innes KE et al. *Altern Med eCAM.* 2012:2012:294058. PubMed.
8. Torino C et. al. *Kidney Blood Press Res* 2014;39:205-11. PubMed.
9. Anding-Rost K et al. *NEJM* 2023;2(9):EVIDoa2300057. PubMed.
10. Lambert K et al. *PLoS ONE.* 2022;17(4):e0267290. PubMed.
11. Zoccali C et al. *Nephrol Dial Trans.* 2023;39(1):7-9. PubMed.
12. Moorman D et al. *Clin J Am Soc Nephrol* 2019;14:268-276. PubMed.
13. Baker L A et al *BMC Nephrol* 2022;23:75. PubMed.
14. Coyne E et al *Clin Kidney J* 2023;16 (11):2185-2193. PubMed.