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IMPACT OF RENAL REHABILITATION TO IMPROVE QUALITY OF LIFE IN CKD PATIENT

Nephrology

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ABSTRACT

The aim of this study is to demonstrate the beneficial effect of exercises in the patient with chronic kidney disease . the progression of chronic kidney diseases [CKD]causes functional limitation and sever disability poor quality of life level of physical activity and exercises tolerance among CKD patient with hemodialysis is low and a sedentary life style is contributes to increases mortality risk this review is focus on importance and benefits of regular exercises for CKD patients. Systemic reviews and metaanalyses of controlled trailed reported that exercises based renal rehabilitation program improved cardiovascular function , muscular function and respiratory capacity and quality of life of CKD patients.

MATERIAL AND METHOD : The study includes 65 patients above the age of 18 in the department of nephrology unit in DKS Postgraduate Institute and Research Center Raipur C.G.

CONCLUSION A 3 times per week exercise session for 12 week [3months] Renal Rehabilitation exercise program is helpful to improved physical capacity and quality of life of CKD patients.

KEYWORDS

renal rehabilitation, chronic kidney diseases, hemodialysis, disability, quality of life

INTRODUCTION

Chronic kidney diseases is an irreversible and progressive kidney failure where body fails to maintain metabolic and electrolytic balance resulting in uremia, metabolic acidosis, anemia and endocrine disorders . Chronic kidney disease [CKD] is defined as the presence of kidney Damage or reduced glomerular filtration rate [GFR] less then 60ml/min/1.73m^2 that is present for three months or more . According to GFR , there are five stage are of CKD from 1 to 5 with GFR > 90ml/min/1.73m^2 [kidney damage with normal or increased kidney function] through GFR <15 ml/min/1.73m^2 [kidney failure and haemodialysis]respectively. its main cause are diabetic mellitus , hypertension, gloumerulonephritis and polycystic kidney diseases .Haemodialysis is the most frequent treatment method for CKD patients which have determined impact on quality of patients life and affects individuals physical and psychological wellbeing.

Chronic kidney diseases patients specially those with end stage of renal disease are associated with the physical symptoms such as fatigue, muscular weakness, peripheral oedema, joint pain , breathing difficulty, and reduced ability to performed activity of daily living.

In order to prevent or at least delay the development of disability in CKD patients intervention of renal rehabilitation is vitally important .therefore the present study has been planned with an aim to improve quality of life of CKD patients admitted in the department of nephrology DKS postgraduate institute and research center Raipur [C.G.].

ROLE OF RENAL REHABILITATION IN CKD PATIENTS

Rehabilitation has been defined by the World Health Organization (WHO) as "the use of all means aimed at reducing the impact of disabling and handicapping conditions and at enabling people with disabilities to achieve optimal social integration". This definition incorporates clinical rehabilitation but also, importantly, endorses the concept of social participation as requiring a matching of the social environment to the needs of people with disabilities. The overall aim of rehabilitation is to enable people with disabilities to lead the life that they would wish, given any restriction imposed on their activities by impairments resulting from illness or injury as well as from their personal context .renal rehabilitation is a multidisciplinary team work which includes physiatrist, geriatrician, nephrologist and other medical practitioner such as nurses, social worker, and occupational or physical therapist in order to obtain the best benefit and improvement of quality of life and minimized the progression of disability.

CHRONIC KIDNEY DISEASES AND DISABILITY

CKD are associated with an increased risk of functional impairment, independent of age, gender, co-morbidities, and cardiovascular events . The association with functional limitation has been observed not only in patients with ESRD and moderate-severe CKD (mean GFR 25 ml/min/1.73 m^2) but also in subjects with milder CKD (mean GFR 50 ml/min/1.73 m^2) . Due to lake of physical activity , increased level of pain , anemia and decreased muscular strength the quality of life and activity of daily living of patient is affected . major aim of renal rehabilitation programme is to improved quality of life and to rehabilitate the patient to do his/her activity of daily living.

PHYSICAL CAPACITY IN CKD PATIENT

Exercise endurance is reduced in CKD patient and these leads to sedentary life style and poor quality of life style of dialysis patients. Aerobic capacity is impaired ranging from 50-80% of normative values in the early stage of CKD [stage 1-4] . impaired physical function has also been reported in these earlier stages of CKD [. Function becoming apparent around stage of 3 When patient reach stage 5 CKD and commence renal replacement therapy [RRT] ,Physical activity levels are approximately 25% of those recorded in age matched sedentary healthy individuals .CKD is also associated with a higher prevalence of disability and difficulty with activities of daily living [ADLs] was reported by 17.6%,24.7% and 23.9% of older [65years] and 6.8% 11.9% and 11.0% of younger [20- 64] yrs. Adults with no CKD stage 1 & 2 and 3& 4 respectively. the relationship between the renal function is tough to be mediated through muscle strength in mild to moderate CKD. The impaired physical capacity leads to reduce quality of life and further aggravated by a sedentary life style. As well as being a strong cardiovascular risk factor, physical inactivity is associated with an increase risk of rapid GFR declined in CKD patient .

METHOD & MATERIAL

In total 60 patient of CKD stage 4 & 5 they were proceed to usual care of renal rehabilitation exercise intervention consisting of usual care and guided exercise 3 times per week, for 12 weeks. Physical function is determined by 3 well established performance base test- Six minutes walk test , Sit –to –Stand test and Gait speed test . our aim is to evaluate the effectiveness of a pragmatic exercise programme . the study was approved by DKS Postgraduate institute and research center Raipur[C.G.].

PATIENTS

60 Adult patients over age of 18 at CKD stage 3-4 receiving

maintenance HD under the care of renal unite at DKS Post graduate institute and research center were considered eligible for renal rehabilitation programme. Demographic data including age , sex , and stage of kidney disease were collected.

Inclusive criteria ; 1 patient who have under gone dialysis treatment for at least 3 months, 2 age older than 18 years ,3 Hb level > 8 mg/dl.

Exclusive criteria ;

1 uncontrolled HTN
2 uncontrolled arrhythmias

METHOD

The ability and capacity to perform ADL (physical functioning) is severely reduced in adults with CKD . Low levels of physical activity and poor physical functioning are strongly associated with mortality and poor clinical outcomes in these patients, regardless of treatment modality . Physical activity has the potential to positively impact upon aerobic and functional ability, and the quality of life of all CKD patients independent of the stage of the disease process . Regular exercisers have better quality of life, physical functioning, sleep quality scores, report fewer physical activity limitations and are less affected by pain or poor appetite. In models adjusted for demographics, co-morbidities and socio-economic indicators, mortality risk was 27% lower among CKD subjects performing regular exercisers compared to subjects who performed poor physical activity . In early stage of CKD, proper exercises have to be planned in those who have mild co-morbidities and not severe limitations. Physical activity including aerobic and resistance exercises have been recommended producing positive effects on cardio-respiratory fitness, physical function and self-reported health . Moderate to high-intensity strength training improves physical performance, muscle mass and quality of life in CDK as well as dialysis older patients .

Aim is to delivered an individualized renal rehabilitation exercises and patient education. The patient were required to attend 3 times weekly 30- 45 minutes of each exercise session supervised exercises session during dialysis and the education session program for a period of 12 week. data were collected before [M0] and [M3] after the 3 months of exercises. An indctive out line of RRP prescription and educational component is parented below [Tab 1]

DURATION	EXERSISES	INTENCITY
10 minute	Warm up	10-12 REP
30 minute	25% Aerobic exercises static cycling 25% strengthening excises Body wt. resistance and free wt. 25% muscle endurance 25 % balance training	10-15 REP Based on 10 REP max.
5 minute	Cool down	

Blood pressure and heart rate during exercise were monitored every 15 min by the automatic blood pressure manometer . Exercise was terminated if (1) the patient requested it; (2) the pulse rate exceeded the value of 80% of the maximal heart rate [the maximal heart rate (beat/min) = 220 – age (years)], and (3) fatigue of the legs occurred.

Six-Minute Walk Test

The six-minute walk test (6MWT) was used as an index of physical capacity, and was also carried out twice – before and after the 3-month program of exercises. It has been shown to be reliable to establish the physical capacity of patients with heart and respiratory insufficiency and also in patients with chronic renal failure . This test can be used to assess the effects of rehabilitation, particularly for those in whom maximal exercise testing is not possible, for example in older patients. Patients walked unassisted for a 25-meter distance of the hospital corridor, accompanied by a physiotherapist. Participants were permitted to stop and to have a rest. The distance of each patient was recorded in meters and as an average walking speed (kilometers per hour)

Quality of life

To evaluate self-reported quality of life, the Polish version of the Short Form 36-item (SF-36v2) questionnaire was used. This questionnaire has 36 items divided into eight scales: Physical functioning (PF), Role functioning/physical, Bodily pain, General health, Vitality, Social functioning, Role functioning/emotional, and Mental health. These scales are scored from 0 to 100. If a score is higher, the self-reported perception of health is better. The questionnaires were completed independently.

Sit-to-stand test:

test initially described as a measure of strength of lower extremity, it is currently also considered a balancing test and has already been validated in patients with chronic kidney disease .

SAFETY ISSUE

To evaluate the safety of the exercise, the following complications and symptoms were registered: incidents of hyper- and hypotension, cardiac arrhythmias, and muscle cramps.

DISCUSSION

Several types of tests can be used to assess functional capacity in general population and in patients with chronic renal disease. Between these tests, 6MWT stands out, being one of most widely used tests in literature, because it is validated, of low cost and easily applied . In this study, 6 MWT was used with no difficulties. Hemodialysis patients have considerable reduction of functional capacity in relation to sedentary healthy individuals of similar sex and age . In the present study, average distance walked by patients in 6MWT was 290m (± 164 m) in initial assessment, under values found by Dipp et al. (397 ± 104 m), Jatobá et al. (493 ± 147 m), Reboredo et al.(516 ± 89 m), Painter et al. (517 ± 189 m), Parsons et al. (101 ± 520 m), Headley et al.

There was a increase in distance walked in 6MWT after six weeks of rehabilitation, and it was above result found by Parsons et al. , who observed increase of 14% in 6MWT after 20 weeks of training in 13 hemodialysis patients, and observed by Henrique et al. , who found an increase of 9% in distance walked in 6MWT after three months of aerobic exercise performed during hemodialysis sessions.

Considering number of repetitions patients reached in sit-to-stand test, there was a significant increase of almost 50%. Kouidi et al.

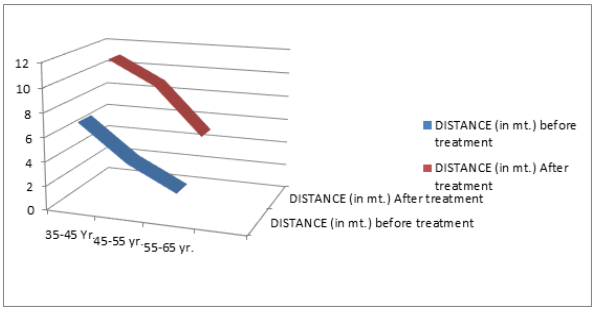
Combination of aerobic and strength training of lower limbs can be one of explanations for significant gains in functional capacity, who suffers influence of peripheral factors such as muscle atrophy and weakness, besides cardio respiratory conditioning . In study of Headley et al. there was a significant increase in distance measured with 6MWT after 12 weeks of strength training in 10 patients with chronic kidney disease on hemodialysis, what is suggestive that impairment of functional capacity may be mitigated by gain of muscle strength.

Several authors have demonstrated chronic kidney disease and dialysis treatment generate negative impacts on life quality of these patient. According to Silveira et al.

RESULT:-

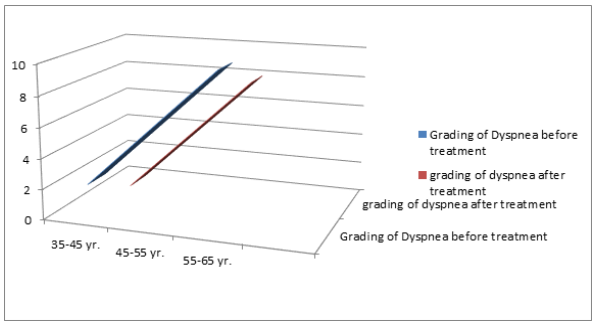
A baseline changes and improvement is seen in physical capacity , muscular strength and respiratory capacity of ckd patients who are undergoing in 12 weak of renal rehabilitation programme . following graphs is helpful to understand the improvement in patients after 3 months of renal rehabilitation programme.

1 The graph denotes the improvement in walking distance in ckd patients according to the age of subjects divided in to 3 groups.



1 Between 35 -45 yrs , 2 Between 45-55 yrs , 3 Between 55-65 yrs

2 The graph below shows the improvement in breathing capacity and reducing the level of dyspnea

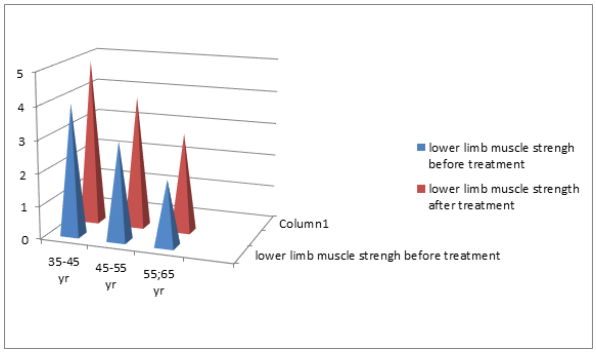


The level of dyspnea is measured accordingly "Revised Borg Scale For Dyspnea"

Revised Borg Scale for
Grading Severity of Dyspnea

0 - Nothing at all
1 - Just noticable
2 - Very slight
3 - Slight
4 - Slight-moderate
5 - Moderate
6 - Some difficulty
7 - Moderately severe
8 - Sever
9 - Very sever
10 - Panic level, maximal shortness of breath

3 The graph below denotes improvements in lower limb muscles strength



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