

EFFECTIVENESS OF RETRO WALKING IN PATIENTS WITH OSTEOARTHRITIS KNEE

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Abstract: This study has been undertaken to investigate Effectiveness of Retro Walking in Patients with Osteoarthritis Knee with objective of knowing the effectiveness of retro walking on pain and disability in patients by using three scale such as Numerical Pain Rating Scale (NPRS), WOMAC index, and Proforma sheet with 40 Osteoarthritis knee patients were divided into two groups. Group A (Experimental group) 20 and Group B (control Group) 20 patients. For experimental group, mean difference of NPRS value is 4.45 which is higher than the control group mean difference value of 2.35. The mean difference value of WOMAC score for experimental group is 9.06 which is also higher than the control group mean difference value of 4.14. This study concludes that retro walking training demonstrates significant improvement in pain and disability scoring of patients with osteoarthritis knee than conventional physiotherapy.

I. INTRODUCTION

Osteoarthritis knee is characterized by mechanical abnormalities involving degeneration of joints, including articular cartilage and subchondral bone

Osteoarthritis most commonly encountered disease of the musculoskeletal system. The physical disability arising from knee osteoarthritis prevents the performance of daily life activities and negatively affects quality of life. The prevalence of knee osteoarthritis is 22% to 32% in India .Commonly females are more affected than males as the age progress.

In knee osteoarthritis, the medial compartment is more frequently affected than the lateral. This is due to higher transfer of loads through the medial compartment than through the lateral resulting in higher external knee adduction movements

Additional factors that increase the risk of developing osteoarthritis of the knee include genetics and obesity

Management of knee OA necessitates a multidisciplinary approach with physiotherapy as the main choice of conservative management , which includes various strategies such as manual therapy , exercises, patellar taping and electrical modalities with or without thermal modalities as measures for pain reduction .

The Chinese and Japanese have long practiced backwards locomotion [also retro walking], well aware that 100 steps backward walking is equivalent to 1,000 steps in conventional walking

Kinematic analysis of backward walking provides evidence that lower extremity muscle activity increases during backward walking. In retro walking the vertical forces and ground reaction forces acting on the knee joint are shown to be reduced and improvement in strength and disability.

Retro walking is associated with increased cadence, decreased stride length and difference in joint kinematics as compared to forward walking and hence may offer some benefits over forward walking alone. So, this study focuses to determine the effect of retro walking in patients with chronic osteoarthritis knee.

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II. OBJECTIVE OF THE STUDY

To find out the effectiveness of retro walking on pain and disability in patients with osteoarthritis knee.

III. REVIEW OF LITERATURE

3.1IK HRISHIKESH YADEV et al ¹(2016)

Did a review article on the effectiveness of retro walking in osteoarthritis knee. They concluded implementation of retro walking as an exercise in rehabilitation of OA knee patients can reduce excessive abnormal adduction torque on knee joint and also improve functional activities.

3.2DEEPI N WADHWA et al ⁶ (2016)

Studied the effects of retro walking on osteoarthritis knee in 40 geriatric subjects. They concluded that retro walking is a suitable adjunct to physiotherapy treatment which is more effective than conventional physiotherapy treatment in reducing pain and improving the disability of participants with osteoarthritis of knee.

3.3XUN SUN et al⁹ (2015)

Conducted an experimental study on backward walking improving physical fitness and balance capacity in 30 overweight female subjects. They were randomly divided into three groups; backward walking group, forward walking group and control group. After 8 weeks of experimental intervention. Physical fitness, balance capacity and other relevant indicators were measured by body composition analyzer, balance capacity tester and energy consumption monitor before and after experiment. They concluded that backward walking and forward walking had a significant effect on reducing body fat and improving physical fitness and balance capacity for overweight females, but backward walking had a better fitness effect than forward walking.

3.4AJITH S et al² (2015)

Studied the effectiveness of retro walking treadmill training on pain and disability in 40 knee osteoarthritis, who were randomized into two groups. They concluded that retro walking treadmill training is beneficial to reduce pain.

IV. METHODOLOGY**4.1 Study Population**

40 Osteoarthritis knee patients were divided into two groups. Group A (Experimental group) 20 and Group B (control Group) 20 patients

4.2 Study design

Experimental study – Randomized clinical trial

4.3 Inclusion Criteria

- Both male and female patients.
- Age group between 40 - 65 years
- Clinical diagnosis and radiographic evidence of OA
- Unilateral involvement
- Subjects who can walk 10 steps backward without any discomfort.

4.4 Exclusion Criteria

- Soft tissue injuries around the knee joint.
- Recent surgeries around the knee joint.
- Any recent fracture in lower extremity and deformities around the knee joint.
- Uncooperative patients.
- Patient with neurological involvement.

4.5 Outcome Measures:

- Numerical pain rating scale (NPRS).
- Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale.

4.6 Materials Used

- Numerical Pain Rating Scale (NPRS)
- WOMAC index
- Proforma Sheet

4.7 Method

- 40 subjects were selected randomly based on selection criteria were recruited in this study and informed consent was obtained from each participant. Subjects were randomly allocated into two groups,
- Group (A) and Group (B). Group A (N=20) subjects were received Retro walking, Wax therapy and Isometric Quadriceps exercise for 10 days.
- Group B (N=20) subjects were received Wax therapy and Isometric Quadriceps exercise for 10 days.
- Subjects underwent two sessions of Retro-walking per day (10 minutes. per session) for 10 days on a flat surface at their maximum pace.
- Home exercise program which includes Isometric Quadriceps exercise was common for both groups.
- Assessment of Pain (NPRS) and disability (WOMAC scale) were carried out before commencement of the treatment and at the end of 10th day.
- Total duration of wax treatment was 15 minutes.

V. DATA ANALYSIS

Table - 1
Shows in Gender in each group

Gender	Experimental		Control	
	N	Percentage	N	Percentage
Male	3	15.0	11	55.0
Female	17	85.0	9	45.0
Total	20	100.0	20	100.0

The above table exhibits the details of about the experimental group 15 percent of the respondents is male and 85 percent of the respondents are female. So the control group on the basis of gender, 55 percent of the respondents are male and 45 percent of the respondents are female.

Table - 2
Shows in experimental Vs control (BMI)

Group	Mean	SD	t-value	p-value
Experimental	25.17	3.67	0.070	0.94 Not Significant
Control	25.25	3.60		

It is evident from the obtained t-value (0.070), there is no significant mean difference in BMI score between experimental and control groups $p=0.94$.

Table - 3
Shows in Experimental Vs Control (NPRS)

Group	Pre	Post	Mean difference	t-value	p-value
	Mean \pm SD	Mean \pm SD			
Experimental	8.05 \pm 0.83	3.60 \pm 1.10	4.45	14.50	0.001
Control	7.80 \pm 0.95	5.45 \pm 0.94	2.35	7.83	0.001

It is observed that NPRS mean difference score is significantly improved in both experimental and control groups. Comparatively in experimental group the NPRS mean difference score 4.45. Which is higher than the control group NPRS mean difference score that is 2.35

Table - 4
Shows in Experimental Vs Control (WOMAC)

Group	Pre	Post	Mean difference	t-value	p-value
	Mean \pm SD	Mean \pm SD			
Experimental	71.93 \pm 5.60	62.87 \pm 4.73	9.06	5.72	0.001
Control	76.47 \pm 3.31	72.33 \pm 3.58	4.14	3.12	0.001

It is inferred that WOMAC mean difference score is significantly improved in both experimental and control groups. Comparatively in experimental group the WOMAC mean difference score 5.72. Which is higher than the control group WOMAC mean difference score that is 3.12.

VI. RESULT

For experimental group mean difference of NPRS value is 4.45 which is higher than the control group mean difference value of 2.35. The mean difference value of WOMAC score for experimental group is 9.06 which is also higher than the control group mean difference value of 4.14.

VI. DISCUSSION

Knee OA is a prevalent condition contributing significantly to functional limitation and disability. Numerous studies has shown secondary gait changes pattern of OA is due to pain, decrease muscle strength, instability, and stiffness. Pain in OA knee is due to increased abnormal ground reaction force loading on joint and decrease extensors moment.

This prolonged usage of secondary gait compensation creates greater imbalances of muscle, progressively reduces muscle strength, endurance, flexibility and later ending to deformity. Retro walking has more advantageous effects compare to forward walking. It increases stride rate, decreases stride length and increases support time and reduces overall range of motion of knee thereby increase active functional range.

As advantages of retro walking include improvement in muscle activation pattern, reduction in adductor moment at knee during stance phase of gait and augmented stretch of hamstring muscle groups during the stride; of these may have helped in reducing disability thus leading to improved function. Retro walking has effect on improving strength of hip extensors leading to reduced hip flexion moment during stance phase and thus preventing abnormal loading at the knee joint and, in turn the disability and leading to improved in function.

The study is aimed to evaluate the effectiveness of retro walking on pain and disability in patients with chronic osteoarthritis knee. In this experimental study 40 patients with osteoarthritis knee were randomly assigned to the study group and control group. Among these 40 patients, 20 patients were included in the experimental group, who received retro walking with conventional physiotherapy (wax therapy, isometric quadriceps strengthening exercise). Control group, who received conventional physiotherapy (wax therapy, isometric quadriceps strengthening exercise) only.

The outcome measures used were Numerical Pain Rating Scale (NPRS) for pain intensity and western Ontario and mc master universities osteoarthritis index (WOMAC) measuring disability.

It is observed that in Numerical Pain Rating Scale, Group A patients, the mean difference value is 4.45 and Group B patients, the mean difference value is 2.35. There is a significant difference between the both in experimental and control group between pre and post test, $P < 0.001$ (significant). So, it is concluded that the experimental group after intervention, the NPRS is reduced.

It is inferred that the WOMAC score of Group A patients, the mean difference value is 9.06 and the Group B the mean difference value is 4.14. The calculated p values show significant difference between experimental and control group between pre and post test in WOMAC score. $P < 0.001$. Therefore it is calculated that in WOMAC, in the experimental group post treatment score is reduced. So the disability is reduced after intervention.

This results also correlate with, Hardik anadkat and Dhanesh kumar KU concluded that the combination of retro walking treadmill training and conventional exercises is more effective than conventional exercises alone in knee OA patients to reduce pain and disability ^[2]. Gauri A Gonthalekar et al Concluded that retro walking as an adjunct to conventional treatment is more effective than conventional treatment alone, in reduction of disability in patients with knee osteoarthritis ^[3]. Pradeep Shankar et al concluded that retro walking is effective in reducing symptom and overcoming physical dysfunction in osteoarthritis of knee.

Deepti N Wadha et al concluded that retro walking is a suitable adjunct to conventional physiotherapy treatment which is more effective than conventional physiotherapy treatment in reducing pain and improving the disability of participants with Osteoarthritis of knee. Rathi Manisha et al concluded that backward walking along with convectional physiotherapy treatment is effective in treatment of OA knee in reducing pain and disability and improving quadriceps strength Xun Sun et al concluded that backward walking had a better fitness effect than forward walking · Shabnam Joshi et al concluded that efficacy of retro walking training in knee osteoarthritis have reported positive outcomes on pain, disability and balance.

Hence, in this study, had found that there is significant reduction of pain and disability in the patients who received retro walking along with conventional physiotherapy.

VIII SUGGESTIONS:

Still large samples of study will provide better results. Further, this study can also be done to find whether there is any influence of Body Mass Index and Gender in reducing pain and disability in Osteoarthritis knee with large samples.

IX. CONCLUSION

This study concludes that retro walking training demonstrates significant improvement in pain and disability scoring of patients with osteoarthritis knee than conventional physiotherapy.

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