

ORIGINAL ARTICLE

Effectiveness of Strength Training Program with and without Hamstring Stretching in Patients with Knee Osteoarthritis

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ABSTRACT

Objective: To determine the outcome of strength training programme; with and without hamstring stretching in Patients with Knee Osteoarthritis.

Study Design: A Comparative experimental study.

Place and Duration of Study: This research study was conducted in department of physical therapy at National Institute of Rehabilitation Medicine (NIRM) Islamabad from 1st January to 31st July 2014.

Materials and Methods: A total of 40 patients were randomly selected and placed into two groups. The inclusion criteria were radiologically diagnosed patients of both genders for knee osteoarthritis of age ranges from 40 to 75 years. The isometric quadriceps strengthening exercise, hamstring stretching exercises and NSAIDs were applied in group A, while group B was treated with isometric quadriceps strengthening exercise and NSAIDs. Both the groups were treated for 6 weeks at 3 days per week and Visual Analog Scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and knee range of motion were used as assessment tools to assess pain, function, and mobility. The measurements were made at the baseline and at the completion of 6 weeks treatment program to obtain numbered data. The data was analyzed through SPSS-20 and paired t test was applied to assess the statistical significance outcomes at 95% level of significance.

Results: The results showed that the patients treated with isometric quadriceps strengthening exercises and hamstring stretching exercises combined with NSAIDs managed pain, function and mobility clinically and statistically more ($p=0.011$, $p=0.021$, $p=0.001$), as compared with group B treated with isometric quadriceps strengthening exercise and NSAIDs ($p=0.931$, $p=0.814$, $p=0.742$), in patients with knee osteoarthritis, as assessed by visual analog scale (VAS), WOMAC index and goniometry.

Conclusion: It is concluded that isometric quadriceps strengthening exercise, hamstring stretching exercises and NSAIDs will managed pain, function, and mobility more effectively as compared with isometric quadriceps strengthening exercise and NSAIDs in patients with osteoarthritis.

Keywords: *knee osteoarthritis, Isometric Quadriceps Strengthening Exercise, Hamstring Stretching Exercise, NSAIDs.*

Introduction

Osteoarthritis is a degenerative joint disease involving the degeneration of joint articular surfaces including cartilage and subchondral bone. It usually involves the large weight bearing joints more than small and non-weight bearing joints. Degeneration of Knee joint is a common and most occurring type of osteoarthritis.^{1,2} The Joint pain, tenderness, stiffness, locking, effusion, osteophytes, muscle atrophy, ligamentous laxity, and deformities are common signs and symptoms associated with knee osteoarthritis. It is usually diagnosed by physical examination and confirmed by radiograph.^{3,4} The prevalence of osteoarthritis is 1.9 million in Australia, 8 million in United Kingdom, and 27 million in USA, while approximately 250 million people have

osteoarthritis of the knee globally, which is 3.6% of the world population.⁵ The management of osteoarthritis is exercise therapy, lifestyle modification, analgesics, and joint replacement surgeries. Physical therapy is one of the key options for patients with knee OA by managing it with life style modification and exercises. The life style modifications involves weight reduction, avoid low sitting and the using of English seats in washrooms.^{1,2} The exercises and manual therapy are commonly used for managing pain, muscle strengthening, endurance, and flexibility. While in advanced stages of Knee OA, where arthroplasty is recommended a comprehensive pre and post rehabilitation are usually followed.⁶⁻¹⁰ This study was conducted on the patients with moderate and chronic stages Knee OA and conservative managed by physical therapy. The objective was to determine the outcome of strength training programme; with and without hamstring stretching in Patients with Knee Osteoarthritis.

Materials and Methods

This Comparative experimental study was conducted

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in department of physical therapy at National Institute of Rehabilitation Medicine (NIRM) Islamabad from 1st January to 31st July 2014. A total of 40 patients were conveniently selected and placed into two groups. The inclusion criteria were radiologically diagnosed patients of both genders for knee osteoarthritis of age ranges from 40 to 75 years. The isometric quadriceps strengthening exercise, hamstring stretching exercises and NSAIDs were applied in group A, while group B was treated with isometric quadriceps strengthening exercise and NSAIDs. Both the groups were treated for 6 weeks at 3 days per week and visual analog scale (VAS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and knee range of motion were used as assessment tools to assess pain, function, and mobility. The measurements were made at the baseline and at the completion of 6 weeks treatment program to obtain numbered data. The data was analyzed through SPSS-20 and paired t test was applied to assess the statistical significance outcomes at 95% level of significance.

Results

All 40 patients from both the groups showed improvement but the patients treated with isometric quadriceps strengthening exercises and hamstring stretching exercises combined with NSAIDs managed pain, function and mobility clinically and statistically more significant (p=0.011, p=0.021, p=0.001), as compared with group B treated with isometric quadriceps strengthening exercise and NSAIDs (p=0.931, p=0.814, p=0.742), in patients with knee osteoarthritis, as assessed by visual analog scale (VAS), WOMAC index and goniometry. (Table-I)

Discussion

The result showed improvements in all patients but the group A treated with isometric quadriceps muscle strengthening exercises, hamstring muscle stretching exercise and NSAIDs demonstrate clinically and statistically more significant results as compared with the other group of patients treated with isometric quadriceps muscle strengthening exercise and NSAIDs. Recent trials have shown that exercise therapy is an effective remedy for managing pain, disability and mobility in patients with knee osteoarthritis. The types of exercises therapy Flexibility, aerobics and resistance exercise training are recommended for patients with knee

Table I: Comparison of mean, standard deviation, and p-value between group-A and group-B (n=40)

Study variable	Group-A (treated with isometric quadriceps strengthening, hamstring stretching and NSAIDs) (n=20)			Group B (treated with isometric quadriceps strengthening, and NSAIDs) (n=20)		
	Mean	SD	p-value	Mean	SD	p-value
Pre VAS (total score 0-10)	6.5	0.525	0.011	6.7	0.62	0.931
Post VAS (total score 0-10)	3.2	0.456		4.5	0.54	
Pre WOMEC (total score 100)	25	0.603	0.021	26	0.769	0.814
Post WOMEC (total score 100)	65	0.701		42	0.699	
Pre knee ROM-flexion (total-135 degree)	120	0.651	0.001	119	0.931	0.742
Post knee ROM-flexion (total-135 degree)	129	0.785		125	0.865	

osteoarthritis.^{11,12}

The aerobic exercises and resistance training improves the patient self-efficacy for stair climbing in patient with knee osteoarthritis.¹³ The capacity of Physical activity improves with Exercise training by reducing pain and disability. Home based strengthening exercises program along with aerobic walking also improves pain and disability in patients with knee osteoarthritis.¹⁴ Exercise therapy is also effective in managing pain in patients with osteoarthritis if applied long term 12 weeks and supervised.¹⁵

Conclusion

It is concluded that the outcomes of strength training programme combined with hamstring stretching exercises and NSAIDs are more effective in managing pain, function, and mobility, as compared with strength training programme and NSAIDs in patients with osteoarthritis.

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