

ORIGINAL ARTICLE

IJPHY

A COMPARATIVE STUDY BETWEEN JOINT MOBILIZATION AND CONVENTIONAL PHYSIOTHERAPY IN KNEE OSTEOARTHRITIS

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ABSTRACT

Background: Osteoarthritis (O.A.) is an active disease process involving articular cartilage destruction, subchondral bone thickening and new bone formation. Worldwide osteoarthritis is estimated to be the fourth leading cause of disability, in which 10% are males and 13% are females. Studies from china, Bangladesh and Pakistan have shown high prevalence of knee osteoarthritis. Pharmacological interventions, surgical procedures and Physiotherapy management play important role in knee Osteoarthritis. In Physiotherapy management of osteoarthritis, manual therapy along with thermotherapy and/or electrotherapy is used. Current study was to evaluate the effectiveness of joint mobilization in knee osteo-arthritis.

Methods: Comparative study was undertaken on 50 patients with osteoarthritis of the knee who were randomly assigned to one of two groups that received Joint mobilization alone (n = 25; mean age, 53 years) or Conventional Physiotherapy (n = 25; mean age, 50 years). Both groups were received their programs for 8 weeks; two sessions per week. Analysis of data within group and between groups of the pre and post treatment values of the function and pain was done using pair t test and independent t test.

Results: Both groups showed significant improvement in ISOA score and VAS. There was statistical significant difference between the two groups (Group A and B) i.e. $p < 0.005$.

Conclusion: Manual joint mobilization improves the effectiveness of the treatment program in treating symptoms of knee OA and improves function in elderly people with knee OA.

Keywords: Knee Joint, Osteoarthritis, Manual Joint Mobilization, Conventional Physiotherapy, Visual analogue scale, Index of Severity of Osteoarthritis

Received 03rd February 2016, revised 05th March 2016, accepted 24th March 2016



www.ijphy.org

10.15621/ijphy/2016/v3i2/94873

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INTRODUCTION

Osteoarthritis (O.A.) is an active disease process involving articular cartilage destruction, subchondral bone thickening and new bone formation [1]. Worldwide osteoarthritis is estimated to be the fourth leading cause of disability, in which 10% are males and 13% are females [2,3]. In Asia, prevalence rates of osteoarthritis knee were found to be high in elderly people, especially women [2].

Studies have shown the prevalence of knee osteoarthritis to be 7.50%, 10.9% and 13.6% in China [4]. In Bangladesh and India it is reported to be 5.78% and 10.20% respectively [5,6]. A study in Pakistan has shown that 28.00% of the urban and 25.00% of the rural population have knee osteoarthritis [7].

Pharmacological interventions include paracetamol, corticosteroids, oral and topical NSAID's, opioid analgesics, glucosamine, intra-articular hyaluronic acid, chondroitin sulphate and Vitamin E supplements. Surgical procedures include joint debridement, osteotomy, uni-compartment arthroplasty and total knee arthroplasty [8].

Physiotherapy management includes thermotherapy that decreases spasm, pain and helps to improve joint range of motion, Cryotherapy, electrotherapy which includes transcutaneous electrical nerve stimulation and ultrasound. Exercises commonly done are strengthening exercises of quadriceps, isometric exercises of quadriceps, cycling on a static cycle.

Joint Mobilization, a type of Manual therapy is recently used to relieve pain and increase joint range of motion in patients with O.A knee. Joint mobilization is intended to modify the quality and available range of the target joint and soft tissue structures. Anterior glide is given to increase flexion, posterior glide is given to increase extension, and superior inferior mobilization of the patella-femoral joint is given to release the adhesions.

A study done by Narayana .C. Mascrain, Ibsen B Coimbra was to investigate the effects on electrotherapy having a total of 40 women with bilateral knee OA randomized for three groups: kinesiotherapy, transcutaneous electrical nerve stimulation (TENS), or ultrasound. All treatments were effective for decreasing pain and bettering the WOMAC index [9].

Similar study by Lange AK, Vanwanseele B, Fiatarone Singh was to assess the effectiveness of isolated resistance training on symptoms, physical performance, and psychological function in people with osteoarthritis of knee. Resistance training showed betterment in the strength of muscle and self-reported measures of pain and physical function in over 50-75% of this cohort; 50-100% of the studies reported an expressive betterment in all but 1 performance-based physical function measure (walk time) [10].

At present there is no study available which is conducted on comparison between Joint Mobilization and Conventional Physiotherapy in Knee Osteoarthritis. So the aim is to compare the two therapies to see their results on pain

and severity in subjects of knee osteoarthritis.

MATERIALS AND METHODS

Fifty subjects (25 in each) were chosen based on inclusion and exclusion criteria from Rehab Care Clinic, Marhaba Poly Clinic, Dabgari Garden, Peshawar and Rehman Medical Institute, Peshawar for the period of 2 months.

All subjects diagnosed with osteo-arthritis including both gender (male or female) between the ages of 35 to 65 years were eligible for the study. Subject having age less than 35 years or more than 65 years, any pathology around the knee, pain due to neurological, spinal or pelvic origin, any other referred pain to hip and knee joint, any recent injuries around the knee, limb length discrepancy were excluded from the study.

Subjects who fulfill the inclusion criteria were divided into two groups. Group A and Group B. Informed concern was taken from each of the subjects prior to participation. Instructions are given to the subjects about techniques performed.

A total of 50 subjects were divided equally in to two groups by random method. Group A (n=25) and Group B (n=25). Group A- Joint Mobilization Group B- Conventional Physiotherapy was given for three sessions per week for 2 month.

GROUP – A Joint Mobilization

Subjects under this group were treated with Joint Mobilization. Subjects in supine position knee slightly flexed and anterior-posterior glide given to lower part of femur and upper part of tibia, and mobilized part held for 10 seconds and 10 repetition was given.

GROUP - B Conventional Physiotherapy

Subjects under this group were treated with Conventional Physiotherapy including strengthening exercises of quadriceps, isometric exercises of quadriceps, cycling on a static cycle.

All the data was analyzed on an intention-to-treat basis, using SPSS software.

Paired t-test was used within group.

Independent t-test was used in between group. Outcome measures were the two tools i.e. Visual analogue scale and Index of Severity of Osteoarthritis.

RESULTS

This study included 50 patients with mean age (50.8 years) and SD of (9.6). The group A having mean age of 53.3 ± 7.7 while that of group B is 49.6 ± 9.6

Table - 1: Distribution of Mean Age

Patient Age	N	Mean	Standard Deviation
Total	50	50.8000	9.58315
Group A	25	53.3200	7.74984
Group B	25	49.6800	9.63379

The t-test for paired samples was used between pre and post test of the ISOA and VAS for the Joint mobilization

group. It was seen from the table and figure, the mean of ISOA before Joint mobilization was (9.28) and it was decrease to (5.20) having p value 0.02, the mean of VAS before Joint mobilization was (3.56) and it was decrease to (1.60) having p value 0.04, which were significant differences between the two means.

Table - 2: Paired Samples Statistics of Group A

	N	Mean	Std. Deviation	t - value
Pre Test ISOA	25	9.28	4.569	0.02
Post Test ISOA	25	5.20	2.972	
Pre Test VAS	25	3.56	1.873	0.04
Post Test VAS	25	1.6000	1.41421	

The t-test for paired samples was used between pre and post test of the ISOA and VAS for the group B. It was seen from the table and figure, the mean of ISOA before Conventional Physiotherapy was (10.12) and it was decrease to (9.20) having p value 0.09, the mean of VAS before Conventional Physiotherapy was (4.84) and it was decrease to (4.20) having p value 0.4, which were not significant differences between the two means.

Table - 3: Paired Samples Statistics of Group B

	N	Mean	Std. Deviation	p - value
Pre Test ISOA	25	10.12	3.887	0.09
Post Test ISOA	25	9.20	4.453	
Pre Test VAS	25	4.84	1.772	0.4
Post Test VAS	25	4.2000	1.70783	

There was significant difference between the two means of ISOA on Joint mobilization Group VS Conventional Physiotherapy Group, the Joint mobilization Group (9.28 vs 5.20) while Conventional Physiotherapy Group (10.12 vs 9.20)

Table - 4: ISOA Group Statistics

ISOA	Pre Group A	Pre Group B	Post Group A	Post Group B
	9.28	10.12	5.20	9.20
P value	0.01		0.03	

There was significant difference between the two means of VAS on Joint mobilization Group VS Conventional Physiotherapy Group, the Joint mobilization Group (3.56 vs 1.60) while Conventional Physiotherapy Group (4.84 vs 4.20)

Table - 5: VAS Group Statistics

VAS	Pre Group A	Pre Group B	Post Group A	Post Group B
	3.56	4.84	1.60	4.20
P value	0.04		0.03	

DISCUSSION

The purpose of the study was to evaluate the effectiveness of Joint mobilization alone versus Conventional Physiotherapy in knee osteoarthritis elderly patients. In this study, both treatment groups obtained successful outcomes, as

measured by clinical reductions in ISOA scores and VAS. There were statistically significant difference found between the two groups at ISOA score and VAS of the knee.

Results of this study showed the following:

1. Manual therapy and exercises had a significant effect in reduction of ISOA score in elderly people with knee OA.
2. Manual therapy and exercises had a significant effect in pain reduction in elderly people with knee OA.

The result of this study were supported by Falconer et al (1992), found improvements in motion (11%), pain (33%), and gait speed (11%) after 12 treatments of stretching, strengthening, and mobility exercises combined with manual therapy procedures performed in a physical therapy clinic over 4 to 6 weeks [11].

In a controlled, randomized, single-blinded study, Deyle et al (2000), demonstrated that manual therapy techniques and exercises applied by physical therapists for 8 clinical visits produced averaged 56% improvement in self-reports of functional ability 54%, stiffness 54%, and pain 60% as measured by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scale and a 12% improvement in 6-minute walk test scores. A placebo control group that received equal clinical attention showed no improvement in WOMAC scores or 6-minute walk test scores. They concluded that a combination of manual physical therapy and supervised exercise is more effective than no treatment in improving walking distance and decreasing pain, dysfunction, and stiffness in patients with osteoarthritis of the knee [12].

Sterling et al (2001), have demonstrated that joint mobilization produces rapid hypoalgesia [13].

CONCLUSION

The aim of this study was to evaluate the effectiveness of Joint mobilization alone versus Conventional Physiotherapy in knee osteoarthritis elderly patients. The participants were 50 subjects, divided into two groups (25 Joint mobilizations alone group, 25 Conventional Physiotherapy group). ISOA score and VAS were evaluated at baseline and at the end of 2 months. The result of this study showed significant improvement in ISOA score and VAS of the knee in both groups.

There were statistically significant differences could be demonstrated at ISOA score and VAS between Joint mobilizations alone versus Conventional Physiotherapy group.

It was concluded that a manual therapy improves the effectiveness of the treatment program of exercises in treating symptoms of knee OA and improves function in elderly people with knee OA.

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Citation

Aftab Ahmad, & Muhammad Daud. (2016). A COMPARATIVE STUDY BETWEEN JOINT MOBILIZATION AND CONVENTIONAL PHYSIOTHERAPY IN KNEE OSTEOARTHRITIS. *International Journal of Physiotherapy*, 3(2), 159-162.