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Effectiveness of Lumbar Mobilizations in Subjects with Osteoarthritis of Knee

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ABSTRACT

Background: Osteoarthritis is a disease process involving cartilage destruction (articular), bone thickening (subchondral) and new bone formation. Physiotherapy management includes thermotherapy, Cryotherapy, electrotherapy, therapeutic and manual therapy.

Objective: The objective of the study was to evaluate the effectiveness of Lumbar mobilization along with conventional Physiotherapy in osteoarthritis of Knee patients.

Methodology: It was a Randomized Controlled Trial in which 32 patients diagnosed with osteoarthritis of the knee were randomly assigned into the Experimental Group (Lumbar mobilization with Conventional Physiotherapy) and the Control group (Conventional Physiotherapy). Both groups received three treatment sessions per week, a total of 06 sessions. An assessment was made for each group at the first visit and at end of program using Western Ontario and McMaster Universities Osteoarthritis Index scale, Numeric Pain Rating Scale, Goniometer, Manual Muscle Testing as assessment tools.

Results: Both groups showed significant improvement in Physical Activity Level, Pain, Knee Flexion, Hamstring Length and Quadriceps Strength. Patient with moderate Kellgren & Lawrence grading in both group showed a marked reduction in pain, improvement in disability, Knee Flexion, Hamstring length, and Quadriceps strength ($p > 0.005$). The experimental group showed more improvement but the difference was not statistically significant ($p < 0.005$).

Conclusion: The difference between the two groups was not significant. So, it is recommended that conventional physiotherapy including electrotherapeutic agents, manual therapy and therapeutic exercises is enough for managing of knee Osteoarthritis.

Key Words: Knee Osteoarthritis, Lumbar Spine, Lumber Mobilization

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INTRODUCTION

Osteoarthritis (O.A.) is a degenerative disease process involving cartilage destruction more prevalent in female than male [1, 2, 3]. In Asia, prevalence rates of osteoarthritis knee were found to be high in elderly people, especially women [2]. In China, Studies have shown the prevalence of knee osteoarthritis to be 7.50%, 10.9% and 13.6% [4]. In Bangladesh and India it is reported to be 5.78% and 10.20% respectively [5,6] 28% of the urban and 25% of the rural population of Pakistan have knee osteoarthritis [7]. The exact etiology of knee osteoarthritis is unknown; however multiple risk factors including age, gender, accumulation of crystals in joint fluid or cartilage, history of immobilization, history of injury to the joint, obesity, prolonged occupational or sports stress, quadriceps muscle weakness, reduced levels of serum Vitamin C and Vitamin D [8,9].

There are three types of idiopathic knee osteoarthritis: patella femoral, medial compartment and lateral compartment of knee joint [10]. The American College of Rheumatology classification criteria for idiopathic knee osteoarthritis is: knee pain with osteophytes on radiographs along with at least one of the following clinical symptoms such as Age more than 50 years, Morning stiffness lasting for 30 minutes or less and Crepitus on motion [11]. Features of OA knee include loss of ROM, loss of knee articular cartilage leads to mal-alignment of leg with a bow-legged or varus deformity, attacks of acute inflammatory synovitis accompanied by increased effusion and muscle spasm are common[12,13].

Most common investigation procedure used in knee osteoarthritis is the radiograph. However recent advances include Ultrasound, MRI scan, CT scan, Arthroscopy and Synovial fluid biopsy [10]. 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, compartment arthroplasty and total knee arthroplasty [8]. Physiotherapy management includes thermotherapy, Cryotherapy, electrotherapy. Exercises commonly done are strengthening exercises of quadriceps, isometric exercises of quadriceps, cycling on a static cycle. Manual therapy is recently used to relieve pain and increase joint range of motion in patients with O.A knee.

High-quality evidence shown by 23 systematic reviews on physical therapy interventions for knee osteoarthritis patients was that weight lessening and exercise decrease pain and increase physical function in knee osteoarthritis patients [14]. A randomized clinical trial of manual therapy procedures and supervised clinical exercise versus exercise program at home conducted on 134 patients with osteoarthritis knee indicated that the application of supervised exercises and manual therapy yielded better symptomatic relief [15]. A single blind, controlled trial resulted that the combination of conventional physiotherapy and passive joint mobilization decreased pain but not stairs ascending-descending time among patients with knee osteoarthritis [16]. An experimental study provides evidence that accessory mobilization of knee osteoarthritic joint immediately produces both local and widespread hypoalgesic effects [17]. At present there is gap for study to conduct on Lumbar Mobilization in Knee Osteoarthritis. The current study was designed to study the effectiveness of Lumbar mobilization with Conventional Physical Therapy in patients having knee osteoarthritis

METHODOLOGY

It was Randomized Controlled Trail (RCT) single blind Study. The subjects were selected from Northwest General Hospital & Research Centre and Habib Physiotherapy Complex, Peshawar. By simple random sampling through lottery method32 patients diagnosed with osteoarthritis of the knee assigned into two groups. The outcome assessor was blinded to group allocation, was not involved in providing the interventions. To conceal the outcomes of the randomization, the allocation numbers were put in concealed envelopes. The Experimental Group received Lumbar mobilization with Conventional Physiotherapy (n = 16) and the Control group revived Conventional Physiotherapy (n = 16).

Both groups received three treatment sessions per week, followed for a total of 06 sessions without drop out. Patients suffering from chronic osteoarthritis of knee on radiological findings age ranging from 40-65 years were the inclusion criteria. Patients suffering from inflammatory arthritis, previously undergone lower limb surgery, co existing low back pain or had lower limb deformities were excluded from the study. Structured Questionnaire, WOMAC, NPRS, ROM, Hamstring Length and Quads Strength were the measuring tools. The subjects were randomly divided into two groups (group A & B), using convenient sampling technique and informed consent of each was taken.

Group A (the experimental group) was given lumbar mobilization which includes; CPA glides (10 glides x 3 = 3 sets =1 session) and transverse glides (10 glides x 3 = 3 sets =1 session). It was also given conventional physical therapy which includes; SWD/Hot pack, knee AP/PA glides (10 glides x 3 = 3 sets =1 session), hamstring stretching and quads strengthening. Whereas group B, the control group will receive only conventional treatment.

RESULTS

The results of this study showed that there was no significant difference in the baseline characteristics (age, OA grade, WOMAC, NPRS, Knee ROM, hamstring length and Quadriceps strength) of both the groups. Experimental group proves helpful in improving level of activity up to 11 % measured on WOMAC index, reducing of 3 scale on NPRS, improving knee flexion upto13° measured by goniometer, improving of hamstring length by 11 degrees and improving quads strength measured by manual muscle testing(all were statistically significant). The results are presented in the tables given below ;

Table I. Base Line Characteristics

Control group proves helpful in improving level of activity up to 14 % measured on WOMAC index(statistically significant), reducing of 4 scale on NPRS, improving knee flexion upto10° measured by goniometer, improving of hamstring length by 7 degrees and improving quads strength measured by manual muscle testing(statically significant).

There was marked improvement in all the outcome measures in both the experimental group and control group.

Table 2. Base Line Characteristics

DISCUSSION

The result of this study were supported by the study of Falconer et al, in which there was increment in ROM i.e. 11%, reduction in pain i.e. 33%, and improvement in gait speed by 11% after receiving therapeutic exercises combined with manual therapy[13]). Deyle et al, found that techniques of manual therapy and exercises applied by physical

Experimental Group	N	Mean	P value
WOMEC Before Intervention	16	39.38	0.00
WOMEC After Intervention	16	28.38	
VAS Before Intervention	16	6.56	0.79
VAS After Intervention	16	3.63	
Knee Flexion Before Intervention	16	100.31	0.04
Knee Flexion After Intervention	16	113.13	
Hamstring Length in Degrees Before Intervention	16	54.06	0.01
Hamstring Length in Degrees After Intervention	16	65.00	
Quadriceps Strength Before Intervention	16	3.63	0.04
Quadriceps Strength After Intervention	16	4.13	

therapists for 8 clinical visits produced averaged 56% improvement, stiffness 54%, self-reports of functional ability 54% and pain 60% as measured by the WOMAC [19].

Sterling et al, have reported in their study that joint mobilization produces immediate hypoalgesia in patients with osteoarthritis of knee joint [20]. A RCT showed that six treatment sessions of manual therapy improve flexion of knee and promote activity in people with anterior knee pain [21]. An RCT recommended that a combination of manual physical therapy and supervised exercises yielded functional benefits for patients with knee osteoarthritis and may delay or prevent the need for surgical intervention [22].

Control Group	N	Mean	P value
WOMEC Before Intervention	16	41.50	0.00
WOMEC After Intervention	16	27.6	
VAS Before Intervention	16	6.75	0.279
VAS After Intervention	16	3.75	
Knee Flexion Before Intervention	16	106.88	0.251
Knee Flexion After Intervention	16	116.56	
Hamstring Length in Degrees Before Intervention	16	58.13	0.202
Hamstring Length in Degrees After Intervention	16	65.00	
Quadriceps Strength Before Intervention	16	3.44	0.04
Quadriceps Strength After Intervention	16	4.13	

A RCT on a short term manual therapy knee protocol significantly lessened pain suffered by participants with knee osteoarthritis pain and improved knee function [23]. A double blind, controlled study provided high evidence that accessory mobilization of knee joint having osteoarthritis immediately produces both local and widespread hypoalgesic effects [24]. An RCT on manual therapy procedures and supervised clinical exercise versus home exercise program proved that manual therapy and supervised exercises had greater symptomatic relief [25].

CONCLUSION

This study shows that conventional physiotherapy including electrotherapeutic agents, manual therapy and therapeutic exercises alone is enough for managing of knee Osteoarthritis.

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