

EFFECTIVENESS OF TIBIO FEMORAL GLIDE VERSUS PROXIMAL AND DISTAL TIBIO FIBULAR GLIDE IN SUBJECTS WITH OSTEOARTHRITIS OF KNEE

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ABSTRACT

Background: Osteoarthritis (OA) is the most common joint disease causing disability. Current physical therapy management for knee OA is aiming to increase range of motion and improve functional ability. The purpose of this study is to find out the effectiveness of fibular glide with conventional treatment for improving range of motion and functional ability in the subjects with knee OA.

Methods: Twenty four subjects with osteoarthritis of knee were selected for the study and randomly divided in to two groups of 12 subjects each. Group A received tibio femoral glide and Group B received tibio fibular glide, ROM was measured by Goniometry and functional ability was measured by WOMAC scale.

Results: The patients those who received fibular glide and tibio femoral glide their functional ability was improved was measured by WOMAC and ROM improved significantly ($p < 0.05$) so both the groups are equally effective.

Conclusion: This study showed that tibio fibular glide and tibio femoral glide are E effective in improving functional ability and ROM in patients with knee osteoarthritis

KEY WORD: Osteoarthritis, ROM, Pain, WOMAC.

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BACKGROUND

Osteoarthritis (OA) is the second most common rheumatological problem and is most frequent joint disease encountered in the clinical practice. It is probably not a single disease but represents the final end result of various disorders as joint failure. OA may cause joint pain, bony or soft tissue swelling, tenderness, bony crepitus, peri-articular muscle atrophy, bony hypertrophy, deformity and marked loss of joint motion. It commonly affects the hands, feet, spine, and large weight bearing joints [1].

OA is the most common disabling condition in

humans affecting 80% of individual over the age of fifty five. This can have an effect on their overall health and wellbeing [2].

There is a higher prevalence of OA with advanced age and in females. Knee osteoarthritis produces significant changes in health-related quality of life, particularly physical, mental and social components of health. The posterolateral surface of the tibia and the head of the fibula form an arthrodiarthral articulation known as the proximal tibiofibular (PTF) joint [3]. An adjacent structure which may contribute to lateral knee pain is the proximal tibiofibular joint [4].

Previous authors have suggested that hypemobility of the proximal tibiofibular joint may be a source of lateral knee pain. During ankle dorsiflexion, torsional stress is placed through the proximal tibiofibular joint, via external rotation and anterior glide of the fibula [5]. Decreased mobility of the proximal tibiofibular joint may subsequently limit ankle dorsiflexion range of motion (ROM). Ankle dorsiflexion restrictions have been previously associated with anterior knee pain [6,7]. and are thought to be due to gastrocnemius/soleus tightness or talocrural joint hypo-mobility [8].

Management of pain in OA knee is a multidisciplinary approach. Physiotherapy, as a mainstay of conservative treatment for OA knee involves the use of various modalities such as manual therapy, exercises, patellar taping, thermal modalities and electrical stimulations as a direct or an indirect pain reduction measure. Manual therapy includes soft tissue manipulation, massage, manual traction, joint manipulation and joint mobilization (Vicenzino 2001). Joint mobilization which involves low-velocity passive movements within or at the limit of joint range of motion reduces pain by modulating the nervous tissues and increases joint motion (Maitland 2005; Vicenzino 2001). The use of joint mobilization is recommended in many guidelines for the management of OA knee, yet the evidence underlying its use is limited.

The Physical therapy management aim to control pain, stiffness, instability, deformity and functional performance of the patient. Different types of therapeutic exercises, such as stretching, strengthening (isotonic, isokinetic, and isometric) and aerobic exercise, and electrotherapy are frequently used for the treatment of different musculoskeletal disorders [7]. Regular physical activity and lower limb strengthening exercises are key components of knee osteoarthritis (OA) management (Zhang et al., 2007). Exercise has shown to have beneficial effects on decreasing symptoms of pain and improving physical function in knee OA patients [9].

Joint mobilization, also called non-thrust manipulation, is a form of manual physical therapy and is a tool used by a physical therapist in the treatment of many disorders of the neurological, muscular, and skeletal system, including OA.

Many common manual mobilization techniques used by physical therapists when treating the knee joint are described by Maitland et al [10]. Knee joint mobilization can be described as an oscillatory manual force applied to the tibiofemoral, proximal tibio-fibular, or patellofemoral joints, in a variety of directions and positions based on the patient's presentation. Mobilizations to the knee may be applied with several different hand positions or grips. Physical therapists typically select 1 of 4 grades, or types of mobilization application based on the amount of resistance and magnitude of movement, which have been described by Maitland et al and Grieve depending on the aim of treatment [11]. The aim of study was to compare the effect of proximal and distal fibular glide in improving the knee range of motion (ROM) and function in the subjects with knee Osteoarthritis.

MATERIALS AND METHODS

A total of 24 subjects 40 to 70 years of age with osteoarthritis of knee who were referred to the department of Physiotherapy at NDMVP's Medical college and research center. Informed consent was obtained from all the subjects before including in the study. All subjects were assessed with WOMAC scale and ROM before giving the treatment.

And patients were included on the basis of inclusion criteria. Patients Age should be 40-70 years. Patients should be diagnosed with Subacute or chronic osteoarthritis of knee. Pain should be present at least in one knee. Patient should be able to ambulate with or without assistive devices.

The exclusion criteria included that Patients had not any history of fracture or trauma to knee joint, History of surgery around knee joint, and Subjects with autoimmune disease, malignancy, Myocardial infarction within past 6 months and Uncontrolled hypertension.

And the results were measured using outcome measure: 1) Knee range of motion 2) WOMAC scale twenty four subjects were randomly assigned to two groups. Group A comprised of 12 subjects was treated with Tibio-femoral glide and group B Proximal and distal tibio-fibular glide. All the subjects were assessed to rule out

pain and restricted range of motion were included in the study and an informed consent was obtained from the subjects.

GROUP A

Tibiofemoral AP glide Therapist should Sit on the table with his thigh fixating the patient’s foot. With both hands, grasp around the tibia, fingers pointing posteriorly and thumbs anteriorly. And Mobilizing Force should apply by extending therapists elbows and lean body weight forward; push the tibia posteriorly with the thumbs.

Patellar glides: Patient Position in Supine with the knee extended. Side-lying may be used to apply a medial glide. And Mobilizing Force should be Glide the patella in a medial or lateral direction, against the restriction.

GROUP B

Proximal fibular glide: Patient should Position in Side-lying, with the trunk and hips rotated partially toward prone. The top leg is flexed forward so the knee and lower leg are resting on the table. Therapist Position and Hand Placement should be standing behind the patient, placing one of the hands under the tibia to stabilize it. Place the base of other hand posterior to the head of the fibula, wrapping your fingers anteriorly. And Mobilizing Force comes from the heel of your hand against the posterior aspect of the fibular head, in an anterior-lateral direction.

Distal fibular glide: Patient Position: Supine or prone. Hand Placement Working from the end of the table, place the fingers of the more medial hand under the tibia and the thumb over the tibia to stabilize it. Place the base of your other hand over the lateral malleolus, with the fingers underneath. Mobilizing Force: Press against the fibula in an anterior direction when prone and in a posterior direction when supine.

RESULTS AND DISCUSSION

Primer version 7 was used for data analysis in this study. The within group (Intra group) comparisons of the change in the knee range of motion and WOMAC index score PRE & POST was assessed by paired t test.

The between group (Inter group) comparisons of the change in the knee range of motion and WOMAC score score PRE & POST was assessed

by unpaired t test. Confidence Interval of 95% was chosen. Probability values of less than ≤ 0.05 were considered significant.

Table 1: Baseline characteristics of Group A & Group B.

Sr. no.	Demographic value	Group A	Group B	P value	Significant
		N = 10	N = 10		
1	Age	52.87	52.28	0.75	NOT SIGNIFICANT
Sex					
2	Male	4(33%)	2(17%)	1	NOT SIGNIFICANT
	Female	8(67%)	10(83%)		

Table 2: Comparison of knee flexion score pre & post-interventional within Group A and Group B.

ROM (F)	Group A	Group B
Pre-interventional Score	116.5	124.1
Post-interventional Score	119.5	128.8
t value	-5.407	-6.917
p value	0	0
Results	EXTREMELY STATISTICALLY SIGNIFICANT	EXTREMELY STATISTICALLY SIGNIFICANT

Table 3: Comparison of WOMAC index score pre & post-interventional within Group A and Group B.

WOMAC	Group A	Group B
Pre-interventional Score	67.67	70.83
Post-interventional Score	60.67	64.67
t value	6.168	9.33
p value	0	0
Results	EXTREMELY STATISTICALLY SIGNIFICANT	EXTREMELY STATISTICALLY SIGNIFICANT

Table 4: Comparison of knee flexion score pre & post-interventional score Between Group A and Group B.

Flexion ROM	Pre-interventional Score	Post-interventional Score
Group A	127.1	130.4
Group B	124.1	128.8
t value	1.509	0.918
p value	0.146	0.369
Results	NOT SIGNIFICANT	NOT SIGNIFICANT

Table 5: Comparison of knee WOMAC INDEX score pre & post-interventional between Group a and Group B.

WOMAC	Pre-interventional Score	Post-interventional Score
Group A	67.67	60.67
Group B	70.83	64.67
t value	-0.465	-0.55
p value	0.647	0.588
Results	NOT STATISTICALLY SIGNIFICANT	NOT STATISTICALLY SIGNIFICANT

DISCUSSION

The purpose of this study was to compare the effectiveness of tibio-femoral glide versus proximal and distal tibio-fibular glides in subjects with osteoarthritis of knee.

In this study, 24 osteoarthritic patients were assigned. 12 patients were in group A who received tibio-femoral glide 3 sets of 30 reps and 30 seconds rest was given in between, other 12 patients were in group B and they received tibio-fibular glides 3 sets of 30reps 30seconds rest was given.

The outcome was measured as ROM using a goniometer and pain and functional activities were measured by WOMAC scale. Outcome measures were assessed on day one pre treatment and after 2 weeks post treatment for both groups.

In group A, the two- tailed P value , for paired t test of ROM & WOMAC scale was extremely statistically significant thus study showed that tibio Femoral glide was effective in improving ROM and reducing the WOMAC score.

Nor azlin m.n. & k. Sulyn established that pain reduction following joint mobilization is seen in this study. An in vitro animal study by sambajon et al. (2003) found a 70% reduction in levels of cellular prostaglandin E₂, a strong inflammatory mediator resulting in hyperalgesia in arthritic joints, within 24 hours of mobilization [12].

Skyba et al (2003) suggested that analgesic effect following knee joint mobilization was primarily due to enhancement of the descending pain inhibitory pathway in the spinal cord, which utilized serotonergic and noradrenergic receptors [12].

The improvement in motor activities following joint mobilization has been associated with hypoalgesic and sympatho-excitatory responses produced during the procedure. Sterling et al (2001) have demonstrated that joint mobilization produces rapid hypoalgesia. The result is in congruous with the findings by Kumar et al (2006) who combined complex knee mobilization and electrotherapy, pain reduction following joint mobilization has been established in previous studies.

This study showed that pain has no correlation with stairs ascending – descending time of osteoarthritic knee. Current result is consistent with findings from Harrison, who found positive correlation between pain and self- reported functional difficulty but not physical performance. Difficulty in performing functional activity in

individuals with osteoarthritis of knee can be attributed to many factors besides pain, such as quadriceps inhibition, obesity, knee laxity, knee alignment, fear of physical activity and self efficacy [12].

In group B, the two- tailed P value for paired t test of ROM and WOMAC which was extremely statistically significant. Thus, study with Proximal and Distal Fibular glide is effective in osteoarthritic knee patients.

In this study proximal tibiofibular joint mobilization has done on the subjects of knee osteoarthritis as a medial side forces increased. Patients with osteoarthritis often have substantially larger varus movements at the knee during gait (Mundermann et al. 2004). Previous study suggests that there is significant motion in this joint during forces and torques consistent with physiologic motion [13]. It has been proposed that the fibula can serve as a channel for dissipation of torsional stresses in the ankle, (Lambert, 1971), and proposed that this could also be the case for excessive stresses in the knee joint itself [14].

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In this study, when the mean scores of ROM and WESTERN ONTSRIO Mc MASTER UNIVERSITY OSTEOARTHRITIS DISABILITY INDEX was analyzed intra group, it was found extremely statistically significant in both groups and has shown reduced WOMAC scores which represent an improvement in the pain, range of motion function activities.

Knee Osteoarthritis presents a serious health care problem and produces a large burden on society. Simple, safe, physical treatment procedures such as tibio femoral and proximal and distal tibio fibular glides could be of great value. This provides pain relief, increases range of

motion, improves functional performance and reduces functional disability. It is a low cost and easy means of treatment in subjects with knee osteoarthritis [15].

CONCLUSION

This study conclude that 2 weeks program of Tibio femoral glide and proximal and distal Tibio fibular glides are equally effective in knee osteoarthritis patients.

ABBREVTIONS

ROM - RANGE OF MOTION

WOMAC - WESTERN ONTARIO McMASTER

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Conflicts of interest: None

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