



A study to find out the immediate effect of macquarie injury management group (ming) protocol on pain and range of motion in primary osteoarthritis knee patients- an interventional study

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ABSTRACT

Osteoarthritis is a disorder of the diarthrodial joint, a slow degenerative disease clinically characterized by pain, loss of range of motion. On a radiograph seen as reduced joint space, formation of osteophytes, sclerosis of bone and deformity. Manual therapy has been proved to be an effective treatment method in knee osteoarthritis (OA), but there is a need to investigate effectiveness of MIMG manual therapy technique. There is limited evidence on effect of MIMG protocol in knee OA. To find the effectiveness of MIMG protocol on pain and range of motion in knee osteoarthritis. 30 subjects with the diagnosis of knee OA stage II and III on Kellegren Lawrence classification were recruited from Shree K.K.Sheth physiotherapy Centre, Rajkot, Gujarat. An interventional study was conducted on 30 subjects. The outcome measures were Pain and Range of Motion (ROM). The intra group comparison was statistically significant with $p = <0.001$. MIMG protocol is effective in treating OA knee. Hence it can be suggested as one of the treatment regime.

Keywords: Primary OA knee, Macquarie Injury Management Group Protocol, Pain, ROM.

INTRODUCTION

The Sub-committee on Osteoarthrosis of the American College of Rheumatology Diagnostic and Therapeutic Criteria Committee defined osteoarthritis as "A heterogeneous group of conditions that lead to joint symptoms and signs which are associated with defective integrity of articular cartilage, in addition to related changes in the underlying bone at the joint margins"[1,2]. It is the most frequent joint disease with prevalence of 22% to 39% in India [3].

The pathophysiology states that osteoarthritic changes are due to imbalance between degradation and synthesis process of the articular cartilage. Fibrillation, erosion and crackling occur in superficial layer of articular cartilage and progress over time to deep layers, which result in narrowing of joint space with loss of shock absorbing mechanism, formation of marginal spurs, sclerosis and large clinically observable erosion. The capsule and synovium are often thickened. All these result in alteration of joint congruency and affects joint stability [4].

Clinical features include pain is antero-medial compartment of tibio-femoral joint, crepitus on moving the joint, swollen joint, wasting of quadriceps muscles, stiffness may be present initially due to pain and muscle spasm and later due to capsular contracture, going up and down stairs[5].

The Macquarie Injury Management Group (MIMG) knee protocol is a new technique in manual therapy developed by Dr. Henry Pollard, a practicing sports chiropractor and a clinical scientist based in Sydney. MIMG knee protocol is a chiropractic approach which includes two techniques: myofascial mobilization and myofascial manipulation. It was introduced by the MIMG group, Australia. The techniques involved are myofascial mobilization technique and myofascial manipulation technique[6].

NEED OF THE STUDY

In past few years there are several studies which have proven the effect of MIMG protocol with duration of few days to weeks but there is no literature which provides information about immediate effect of the same.

Therefore this study will add to the growing body of knowledge whether the MIMG protocol gives immediate effect in pain and range of motion. In such a case it should be the preferred choice of therapy. So, here the purpose of the study is to find out the immediate effect of MIMG protocol on pain and range of motion in patients with primary OA knee.

AIMS AND OBJECTIVES

Aim: The aim of this study is to find the immediate effect of MIMG on pain and range of motion in patients with primary osteoarthritis.

MATERIALS AND METHODS

Study design: An interventional study.

Sampling technique: Purposive sampling.

Study setting: Shree K.K.Sheth Physiotherapy College, Rajkot.

Sample size: Total 30 subjects.

Source of data: Shree K.K.Sheth Physiotherapy Centre, Rajkot.

Study population: Males and females with primary OA knee.

Study duration: One time study.

SELECTION CRITERIA:

Inclusion criteria:

1. Age-40 to 70 years of age[7].
2. Gender- both males and females.
3. Subjects who are clinically diagnosed with primary OA knee.

Exclusion criteria:

1. Patients with history of hip and/or back injury and lower-limb joint replacement.
2. Participants who had a joint replacement surgery, history of meniscal or other knee surgery in past 6 months.
3. Fractures at knee and hip joint, deformity at lower limb, osteoporosis, neurological deficits, systemic illness & metabolic disorder[6].

Materials: Pen, Paper, Treatment table, Record and data collection sheet, WOMAC scale, Goniometer, Consent form.

Method of data collection: A total 30 patients were selected for study by giving consideration to inclusion and exclusion criteria. All the subjects were explained about the purpose and the test procedures & written consent was obtained. Pre and post intervention, pain and ROM were taken. Pain can be measured for severity on a visual analog scale. It is one of the most commonly used pain measurement tools. There is a 10 cm line and patient is asked to bisect line at a point representing self-reported position on the scale. The patient's score is then obtained by measuring from the zero mark to the mark bisecting the scale[8]. The reliability of VAS is 0.60 to 0.77 and validity is 0.64 to 0.84[9].

Measurement procedure:

MAQUARIE INJURY MANAGEMENT GROUP PROTOCOL (MIMG): The intervention group received a MIMG(Macquarie Injury Management Group) knee protocol. It consists of a non-invasive myofascial mobilization

procedure and an impulse thrust procedure performed on the symptomatic knee of participants. In cases where OA was bilateral; mobilization was performed on both knees [6].

Myofascial mobilization technique: Figure 1: The patient lay supine near the homolateral edge of the couch. The practitioner sat on the homo-lateral side of the couch with the cephalic thigh under the leg of patient’s involved limb and superior to the patient’s knee. The patient’s lower hamstring area rested on the practitioner’s thigh with their knee able to rest in 90^o of flexion. The practitioner had two choices of contacts: 1) a pincer contact with the thumb and index either side of the medial and lateral superior poles of the patella. 2) A reinforced web contact supporting the medial and lateral superior poles of the patella. The second position was recommended for those practitioners who have a hypermobile thumb. The patient was then instructed to begin actively extending their knee through the pain free range of motion while the practitioner maintained contact at the patella. The force through the patella was in a plane applied at a tangent to the angle of the knee to avoid a compressive load. The patient extended the knee as far as possible in a pain free manner from the initial starting position. The practitioner maintained the contact at the patella during this movement. This was repeated upto 10 times[6].

Myofascial manipulation technique: Figure 2: the patient laid supine and the practitioner stood on the homo-lateral side of the couch with the patient’s leg gripped between the thighs to apply a distractive force to produce traction over the tibio-femoral joint. The practitioner contacted the knee with hands either side. Both thumbs contacted on the tibial tuberosity and the fingers wrap around the knee to the distal end of the popliteal space. An impulse thrust was then delivered, directed in the caudal direction to mobilize the joint in a near full extension position[6].



Fig.1(myofascial mobilization)



Fig.2(myofascial manipulation)

RESULTS

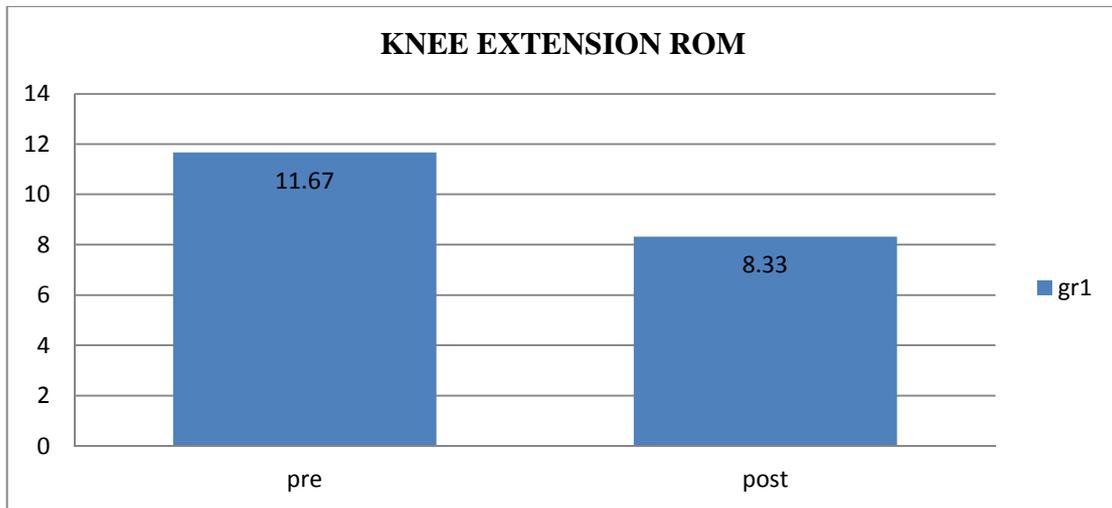
The data was analyzed by SPSS version 20. ROM of knee extension was analyzed by paired t test. Obtained value of t test was 4.817 which show significant improvement in ROM of knee extension post treatment. Pain was analyzed by Wilcoxon sign ranked test. Results show significant immediate effect of MIMG protocol in improving ROM of knee extension.

TABLE 1: Result showing comparison of knee extension ROM within the group

Paired Samples Test									
	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	pre - post	3.333	3.790	.692	1.918	4.749	4.817	29	.000

Interpretation: table shows mean and SD of knee ROM within the group.

GRAPH 1: Pre and Post comparison of mean.



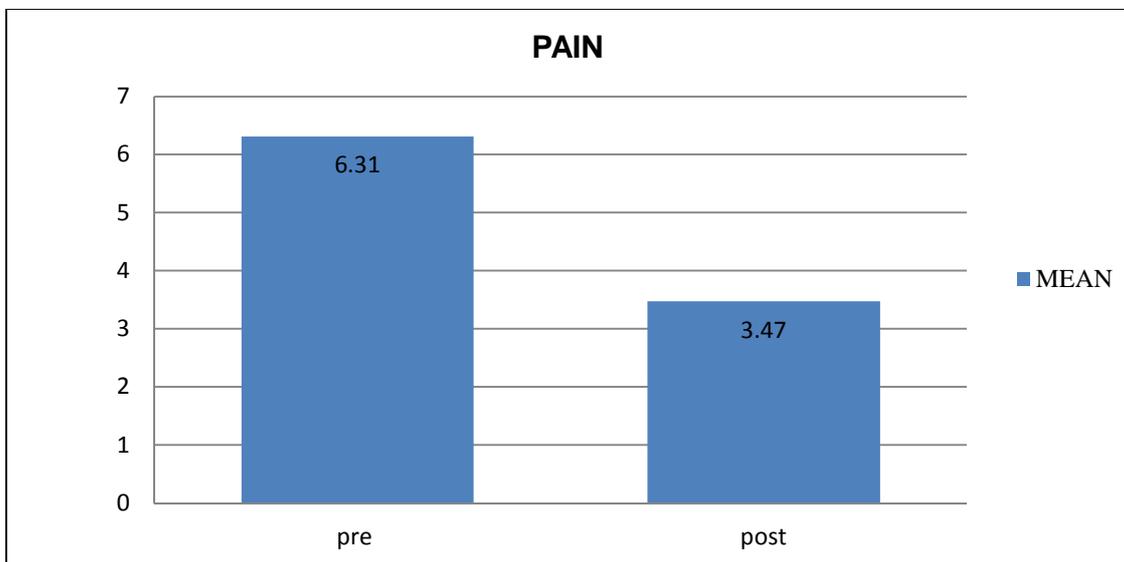
Interpretation: graph shows comparison of mean within the group.

TABLE 2: Results showing difference in pain within the group

Test Statistics ^a	
	POST – PRE
Z	-3.868 ^b
Asymp. Sig. (2-tailed)	.000
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Interpretation: table shows difference in pain within the group.

GRAPH 2: Pre and Post comparison of mean



Interpretation: Graph shows comparison of mean within the group.

DISCUSSION

The results show that there is immediate effect of MIMG protocol on pain and knee extension ROM. The study is in favor of experimental hypothesis of this study. This study was designed to find the effectiveness of Macquarie injury management group protocol in reducing pain and improving ROM of the patients with osteoarthritis of the knee.

This study proves the efficacy of myofascial mobilization and myofascial manipulation at knee joint in reducing pain and disability associated with knee OA. In addition, this study provides the evidence for the short term effectiveness of the MIMG protocol at the knee joint in the management of knee OA. The results in this study were incongruous with the randomized controlled trial carried out by Henry Pollard et al[6] on the effect of a manual therapy knee protocol on osteoarthritis knee pain: they investigate that, a short-term manual therapy knee protocol significantly reduced pain suffered by participants with osteoarthritis knee pain and resulted in improvements in self-reported knee function immediately after the end of the two week treatment. The present study explains the short term efficacy of the myofascial mobilization technique and myofascial manipulation technique derived from Macquarie Injury Management Group Knee Protocol (MIMG) in reducing pain and improving ROM in patients with osteoarthritis knee.

MIMG consisted of a non-invasive myofascial mobilization. This mobilization procedure stretches the joint capsule in the sagittal plane, gently mobilizes any restriction to normal movement within the limits of patient tolerance and likely loosens adhesions within the joint. In addition, it may be used on anterior thigh musculature to effectively mobilize tight myofascial thigh structures.

The second part of the procedure utilises a manual therapy procedure that is not under the voluntary control of the patient. It involves the application of longitudinal traction of tibio-femoral joint in a manner designed to distract the knee and mobilize the joint in near full extension position. The object of this procedure is not to produce joint cavitation, more so to mobilize the joint.

As this study proved the efficacy of MIMG on a short term basis, the combination therapy along with supervised exercises can be employed to demonstrate short term and long term effects to manage the OA symptoms to delay or prevent the need for surgical intervention.

LIMITATION:

Study is done with small sample size and primary osteoarthritis as a whole was chosen.

FURTHER RECOMMENDATION: Study should be carried out with larger sample size and on more of specific population.

CONCLUSION

The MIMG manual therapy knee protocol outlined in this research demonstrated significant improvement in ROM and reducing dysfunction in participants with knee osteoarthritis. In addition, no participants reported adverse effects/discomfort with intervention.

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