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Single Case Study on the Effectiveness of Macquarie Injury Management Group (MIMG) Protocol on the Subject of Primary Osteoarthritis of Knee

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Abstract

Aim: *To check the effectiveness of Macquarie Injury Management Group (MIMG) protocol in subject of primary osteoarthritis of knee. Purpose: Manual therapy has been shown to be an effective treatment for knee osteoarthritis, but it is necessary to evaluate the effectiveness of the MIMG manual therapy technique. However, there is a dearth of literature on the effectiveness of Macquarie injury management group (MIMG) protocol in subject of osteoarthritis of knee.* ***Methodology:*** *This is a single case study where a patient with grade II of primary osteoarthritis of knee reported to the OPD of Jorhat Medical College and Hospital. MIMG techniques were performed on the patient's affected knee under constant guidance for three alternate days a week for 2 weeks. Baseline measures of VAS for pain goniometry for ROM and KOOS for functional independence were taken on day 0, 7th and 14th day.* ***Results:*** *Data was gathered before and after treatment, and the values were analyzed using SPSS software. It was seen that VAS decreased from 7 to 3 on the last day, range of motion for flexion and extension also showed gradual increase and functional independence using KOOS (Knee Injury and Osteoarthritis Outcome Score) came from 43 to 76 at the end of the study period.* ***Conclusion:*** *From this case study we believe that the protocol outlined in this research demonstrated significant improvement in ROM and reducing pain and increase in functional independence in a subject with knee osteoarthritis and additional treatment options need to be explored and studied further.*

Keywords: Osteoarthritis of knee, Macquarie injury management group protocol, knee injury and osteoarthritis outcome score

INTRODUCTION

Osteoarthritis (OA) is a degenerative joint condition and the most common chronic disorder of synovial joints among the aging population. In India, its prevalence ranges from 22 to 39%. It is one of the most widespread musculoskeletal issues, impacting 30–40% of individuals by the age of 65 years [1, 2].

Global estimates suggest that 9.6% of men and 18% of women over 60 years old have symptomatic osteoarthritis, with knee involvement affecting both genders equally between the ages of 55 and 64 years. The most commonly used method for diagnosing OA is based on the radiological appearance of the joint, known as the Kellgren and Lawrence classification of osteoarthritis [1, 3].

The pathophysiology of osteoarthritis involves the breakdown of articular cartilage. Cracks develop in the superficial layer of the cartilage and gradually

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extend to the deeper layers, leading to a reduction in joint space. The joint capsule and synovium often become thickened, resulting in changes to joint congruency and affecting joint stability [4, 5].

The Macquarie Injury Management Group (MIMG) knee protocol, developed by Pollard *et al*. in 2008, is a relatively new manual therapy technique. It consists of two methods: myofascial mobilization and myofascial manipulation. The use of MIMG techniques for treating knee osteoarthritis has been documented by several researchers, as it is non-invasive and has no significant side effects. However, limited research has focused on this intervention for the aging population [6, 7].

OBJECTIVE

To study the effectiveness of Macquarie Injury Management Group (MIMG) protocol in subject of primary Osteoarthritis of knee.

METHODOLOGY

This is a single case study involving a female patient with grade II knee osteoarthritis who visited the OPD of Jorhat Medical College and Hospital. MIMG techniques were applied to the affected knee under continuous supervision, three days a week on alternate days, for a duration of 2 weeks.

Baseline measurements of VAS for pain, goniometry for range of motion, and KOOS for functional independence were recorded on day 0, day 7, and day 14.

Tools used:

1. KOOS Score.
2. VAS Scale.
3. Treatment plinth.
4. Towel.
5. Pillow.
6. Goniometer.

Procedure for Macquarie Injury Management Group

MIMG includes a non-invasive myofascial mobilization and an impulse thrust technique applied to the symptomatic knee of the participants. In cases where patients have bilateral osteoarthritis, both knees will be treated.

Myofascial Mobilization Technique

The patient will lie in a supine position near the edge of the couch, with the knee to be treated resting on the therapist's thigh and the patient's knee flexed at 90°. The therapist will choose the appropriate technique based on the patient's comfort.

1. A pincer grip using the thumb and index finger on either side of the medial and lateral superior poles of the patella, or
2. A reinforced web contact supporting the medial and lateral superior poles of the patella.

After the therapist establishes contact, the patient will be instructed to actively extend the knee within a pain-free range of motion. The force applied to the patella will follow a tangent to the knee angle to prevent compressive load. The patient will then extend the knee as far as possible in a pain-free manner from the starting position. The practitioner maintains the contact at the patella throughout movement (Figure 1). This will be done for 10 times [8–15]. This will be followed by the myofascial manipulation technique.

Myofascial Manipulation Technique

The patient will be in supine with the therapist gripping the patient’s leg at the lower leg, between the thighs of the therapist. This allows the therapist to apply a distractive force, creating traction over

the tibio-femoral joint. The practitioner secures the knee by placing both thumbs on the tibial tuberosity and wrapping the fingers around the knee (Figure 2). An impulse thrust is then applied in a downward direction to mobilize the joint while it is in a near-full extension position [7].

Figure 1. Myofascial mobilization technique.

Figure 2. Myofascial manipulation technique.

STATISTICAL ANALYSIS

For VAS, the independent t test t=0.0036, conventional criteria ($p<0.05$), the variation is regarded as statistically significant.

For range of motion the independent t-test, t=0.0023, conventional criteria ($p<0.05$), the variation is regarded as statistically significant.

For functional independence independent t-test, t=0.0038, conventional criteria ($p<0.05$), the variation is regarded as statistically significant.

RESULTS

Data was gathered before and after treatment, and the values were analyzed using SPSS software. It was seen that VAS decreased from 7 to 3 on the last day of treatment.

For range of motion for flexion and extension also showed gradual increase and functional independence using KOOS (Knee Injury and Osteoarthritis Outcome Score) came from 43 to 76 at the end of the study period (Figures 3–5).

DISCUSSION

Many studies have been done previously on osteoarthritis of knee patients and their treatment approach in reducing pain and increase in functional independence and range of motion [2, 4]. It was seen that VAS decreased from 7 to 3 on the last day of treatment. The MIMG protocol, which includes a non-invasive myofascial mobilization procedure and an impulse thrust technique targeting the patello-femoral articulation, resulted in a greater reduction in the VAS score. Pollard *et al.* found that MIMG provided short-term benefits for self-reported pain and knee function in their study, which utilized a placebo effect of TENS with the intensity set to zero [6]. The statistical analysis supports the efficacy of MIMG protocol in this population. This aligns with existing literature that advocates for MIMG protocol as an effective conservative treatment for primary osteoarthritis of knee.

Shukla said that MIMG protocol showed effectiveness in improving functional independence and also increase in range of motion. The results of the study observed during the 2-week period, intervention being given 3 days alternately in a week, is statistically significant [1].

Despite the positive outcomes observed in this single case study, it is also essential to acknowledge its limitations. The findings are derived from a single patient case, which restricts the generalizability of the results. Future research should involve larger sample sizes to confirm these findings and evaluate the long-term benefits [16–21].

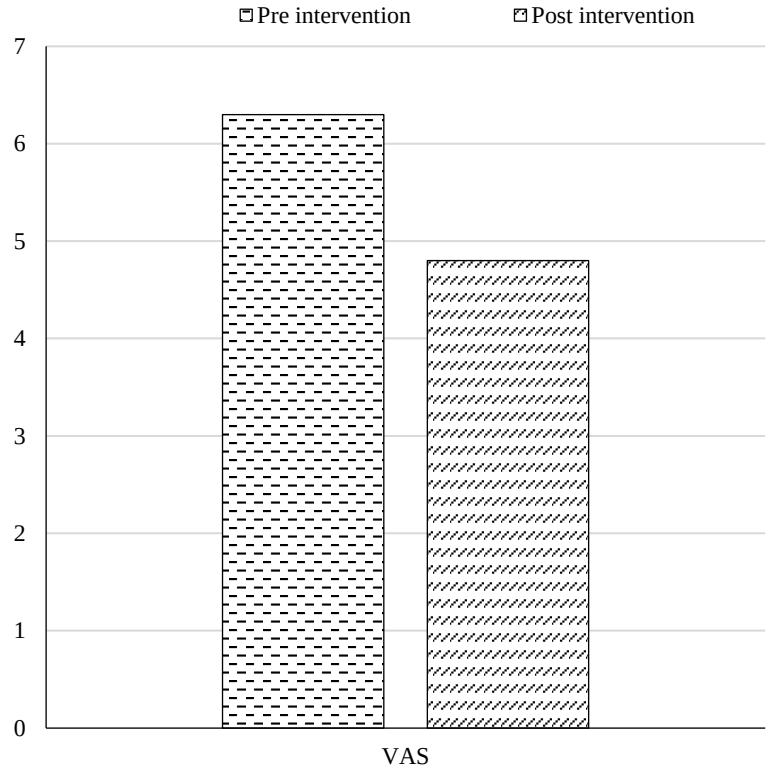

Figure 3. Visual analogue scale (VAS).

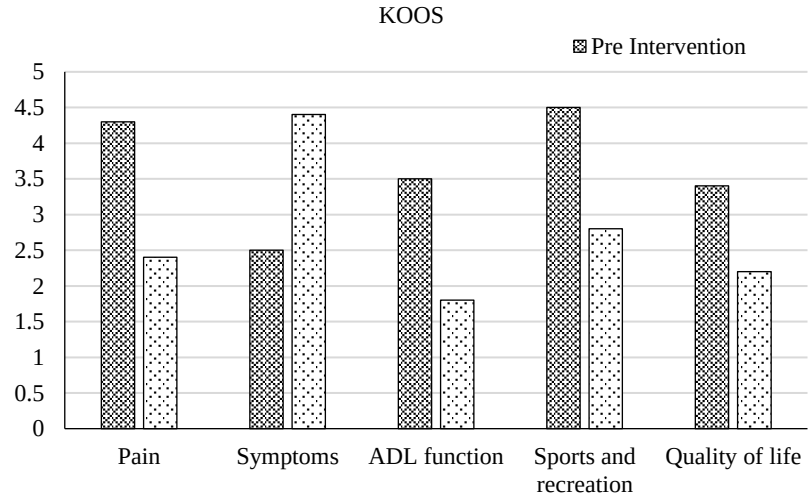

Figure 4. KOOS score.

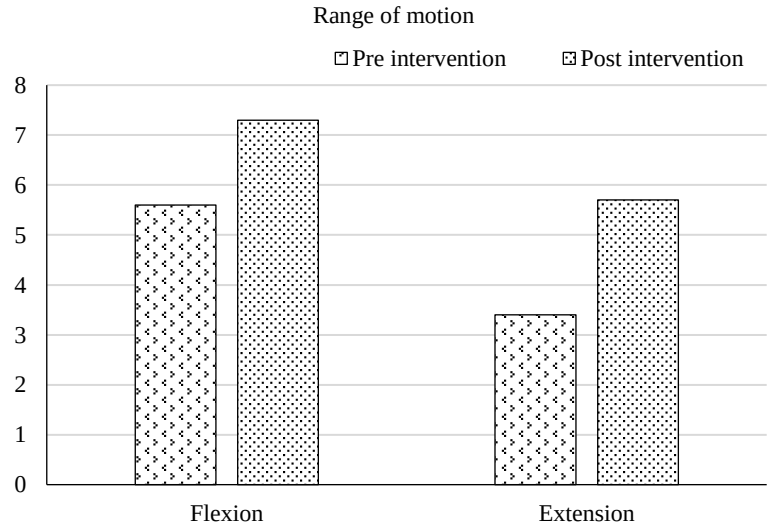

Figure 5. Range of motion.

CONCLUSION

In this single case study, the MIMG protocol resulted in pain relief and improvement in other symptoms, as well as enhanced daily activity and knee-related quality of life. Therefore, it was concluded that both techniques of the MIMG protocol were effective for knee osteoarthritis. It is further recommended that these techniques be combined with other manual therapy methods in the treatment regimen for OA to achieve better outcomes for patients.

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