

Long Term Effects of Mulligan Mobilization with Movement Versus Macquarie Injury Management Group on Function and Pain of Knee Osteoarthritis

Effects of Mulligan Mobilization Versus Macquarie Injury Management

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ABSTRACT

Objective: To compare the long term effects of Mulligan Mobilization with Movement versus Macquarie Injury Management Group on pain and function of knee osteoarthritis.

Study Design: Randomized Controlled Trial study

Place and Duration of Study: This study was conducted at the Revival Physiotherapy Center, Lahore in last 06 months.

Materials and Methods: Through non-probability convenient sampling technique 26 diagnosed patients with osteoarthritis were included in the study. Subjects were randomly divided into two groups by using flip coin method. Patients in Group 1 received MIMG with conventional physical therapy and in Group 2 received MWM with conventional physical therapy. Visual analogue Scale, Non modified WOMAC were used as outcome measuring tools. Readings were taken pretreatment and at the end of 6th week. Statistical analysis was done by SPSS 21.0.

Results: There were statistically significant difference in results of VAS in between group analysis. Pain decreased to greater extent in post treatment of MMG with routine physical therapy group with mean value 8.89 ± 2.37 as compared to 7.16 ± 1.17 in MWM with routine physical therapy group. WOMAC Score increased to greater extent in post treatment of MIMG with routine physical therapy group with mean value 59.78 ± 13.59 as compared to MWM with routine physical therapy 71.89 ± 12.40 . VAS score increased to greater extent in post treatment of mobilization with movement and with routine physical therapy group with mean value 17.84 ± 3.71 as compared to routine physical therapy group 18.00 ± 4.16 .

Conclusion: It concluded that Macquarie Injury Management Group has statistically significant results as compared to Mulligan Mobilization with Movement on pain and function of knee osteoarthritis.

Key Words: Knee Pain; Movement with Mobilization; Routine Physical Therapy; Osteoarthritis; Visual analogue scale

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INTRODUCTION

Knee osteoarthritis is basically a joint inflammation that is extremely prevalent with a substantial socioeconomic stress.¹ It is a common source of pain and disability in the elder people. OA of the knee is mainly affect the synovium sheet, the bones and the cartilage in the joint.² The synovium is the soft sheet that defences the joint.

Similarly, Cartilage is the smooth tissue that works as a pillow and is responsible for a smooth surface of the joint. So, when these main parts of the joint break down due to inflammation, they do not protect the joint and then bone damage take place.³ Osteoarthritis is generally thought to be the result of local mechanical factors acting as part of systemic susceptibility.⁴ The most common form of osteoarthritis of the lower limbs is osteoarthritis of the knee.⁵ ≥ 60 years of age had symptomatic radiographic osteoarthritis of the knee.⁶ The development of the condition OA in knee usually begins from the antero-medial division of the knee joint leading to fibrillation, sclerosis, burning, and osteophyte formation.⁷ The Kellegren and Lawomen method is one of the proven methods in which OA is classified into five brands based on the degree of destruction in radiographic images.⁸ Grade 0 is considered as normal knee. The next one is grade 01, in this stage of osteoarthritis very little spurs of bone are present on the bone.⁹ The grade two of knee OA is the

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“mild” condition. Patients feel pain and discomfort after exertion and long sitting.¹⁰ Third grade is the “moderate” stage in which cartilage of the bone showed a little damage and synovial fluid of the joint is also insufficient.^{11,12} In this stage patients faced pain and limitations during kneeling, walking, running and sitting. Similarly stage four in which bones and cartilage are totally in the damaged condition. Persons with this grade experienced high grade pain, swelling around the joint and restrictions in daily life activities.^{13,14} Mulligan techniques of Mobilization With Movement is an innovative method of joint movement with dynamic movement, consisting of a therapist that combines dynamic movement with the power of pain-free access.¹⁵(1) The Macquarie Injury Management Group (MIMG) Knee Control is an innovative and non-invasive method of manual therapy developed by Dr. Henry Pollard.¹⁶ The MIMG protocol on the knee is a methodology using chiropractic methods that consists of two methods that are soft tissue release and myofascial manipulation. (9) These methods are new methods for those physiotherapists who wanted to deal with pain and prioritize patients.¹⁷ The aim of this study is to compare the long-term effectiveness of MWM versus MIMG on pain and function in OA knee

Matheus G. Gomes et.al 2020, conducted a study to find out the short term effects of MWM on function and pain. After the treatment and evaluation, the study concluded that MWM protocol was significantly reduced the pain and improved function of the knee.¹⁸ Hani A. AlKhawaja et.al (2018) conducted a study to look into the effect of MWM on pain and functions in patients of knee osteoarthritis there was comparison of MWM with the sham MWM. In the conclusion, this study found that MWM delivered more positive and effective results as compared to sham MWM over the pain and function of knee osteoarthritis.¹⁹ Swathi et. al 2015, in a study, compared the short term effectiveness of MIMIG and MWM protocol on pain and function in the osteoarthritis of knee. In the results the study showed that both groups were affective in the treatment of knee OA.²⁰

MATERIALS AND METHODS

It was a registered Randomized Controlled Trial (NCT04995250).In which Non probability convenience sampling technique was used. 26 Sample size was calculated through epitool software. Data was collected from Revival Rehab and Medical Complex. According to grade 1 and 2 of Kelly-green and Lawrence participants were included in the study, age range 50 and above of both gender with symptoms of less than 30 minutes of morning stiffness, crepitus on active motion, tenderness and No palpable warmth of synovium were included in the study. Those Patients were excluded who presented with any surgery done in

last 6 months and those with any metal implants in lower extremity, any infectious or neoplastic disease, Post-Surgical knee stiffness or Secondary knee OA with any peripheral vascular disease were also excluded from the study. Randomization of participants was done by using flip coin method.

Group A Participants in Group A were treated with MIMG (soft tissue mobilization) along with base line treatment that included 10 min Hot pack, knee Isometrics and Stretching. For the application of MIMG patient lies supine with knee in extension, therapist places both hands on the knee and gently apply soft tissue release for 2 to 3 minutes. **Group B** Participants in Group B were treated by Mulligan Mobilization with movement with base line treatment that included 10 min Hot pack, knee Isometrics and Stretching for the application of MWM patient lies supine with knee flexion of 30 degrees, therapist put right hand below the knee and left one above the knee. Apply the lateral glide on the joint. This technique was applied for 3 times. All patients received 18 treatment sessions over a period of 6-weeks. Follow up value was taken after 18 sessions. Western Ontario and McMaster Universities Arthritis. (WOMAC), Visual Analogue Scale and Goniometer were used as outcome measuring tools. The data was analyzed using SPSS version 21. Normality of data was checked by using Shapiro-Wilk test. Non-Parametric tests (Kruskal Willis Test, Fried-men Anova) were used while comparing variables having non-significant p values (p>0.05). Frequency tables, bar charts and pie charts were used to show summary of group measurements measured over time.

RESULTS

To test the normality Shapro Wilk test was used. In the statistics analysis VAS with the p value 0.002 showed significant results and in WOMAC scale with the value 0.086. So non-parametric tests were applied. Descriptive statistics were calculated.

Table No.1: With-In Group Compression (Friedman’s Anova)

		Mean	S.D
Group A	Age of Participants	56.0769	4.05096
	Gender	1.46	.519
	BMI	2.3077	.94733
Group B	Age of Participants	56.6923	4.73259
	Gender	1.54	.519
	BMI	2.3077	.94733

The comparison of pre-treatment and post-treatment WOMAC and VAS values between two groups was done using Kruskal Willis test. Analysis revealed that there was statistically significant difference in mean and standard deviation values of both groups. MIMG

with routine physical therapy group showed greater reduction in WOMAC and VAS score with mean value of 14.00±7.00 as compared to routine physical therapy group with mean value of 13.00±20.00.

Table No.2: Between Group Comparison (Kruskal Walli's Test)

	Mean	Standard deviation	Chi - square	Df	Asymp. Sig. P-value
Womac (pre)	3.96	.196	74.004	3	0.001
Womac (follow up 1)	3.35	.485			
Womac (follow up 2)	2.50	.510			
Womac (post)	1.31	.788			
Vas (pre)	8.50	.510	78.004	3	0.001
Vas (follow up 1)	6.54	.508			
Vas (follow up 2)	4.50	1.175			
Vas (post)	1.96	1.612			

Table No.3: The comparison of pre-treatment and post-treatment WOMAC and VAS values

	Group of participants	Mean rank	Chi-square	Df	Asym sig. P-value
Womac (pre)	Group a	14.00	1.000	1	0.317
	Group b	13.00			
Womac (follow up 1)	Group a	9.00	13.235	1	0.001
	Group b	18.00			
Womac (follow up 2)	Group a	7.00	25.000	1	0.00
	Group b	20.00			
Womac (post)	Group a	7.00	22.354	1	0.00
	Group b	20.00			
Vas (pre)	Group a	14.00	.148	1	0.701
	Group b	13.00			
Vas (follow up 1)	Group a	13.50	000	1	0.003
	Group b	13.50			
Vas (follow up 2)	Group a	7.00	20.024	1	0.001
	Group b	20.00			
Vas (post)	Group a	7.00	20.02	1	0.00
	Group b	20.00			

The comparison of pre-treatment and post-treatment WOMAC and VAS values with in groups was done using Friedman test. Analysis revealed that there was statistically significant difference in mean and standard deviation values of within groups. MIMG with routine physical therapy group showed greater reduction in WOMAC scale score with the significant value 0.001.

DISCUSSION

The aim of this study was to compare and find the long term effects of two non-invasive treatment techniques which are MIMG and MWM Mobilization for the management of chronic knee osteoarthritis. While analyzing the outcomes measures of this study, it was observed that significant improvement was found in both groups, but Macquarie Injury Management group showed improved results in terms of long term pain and functional outcome than Mulligan Mobilization with Movement. A study was done in which Mulligan's MWM and MIMG protocol were used to find its short term effectiveness in treating OA knee. The comparison within groups was significant but between groups was not statistically significant.¹ P-value was less than 0.05 for pre & post treatment value but it was non-significant when between groups analysis was performed. Current study showed contrast findings in relative to this study, p-value was less than 0.05 on between group analysis. MIMG protocol showed better results in improvement of pain and range. With-in group analysis both groups showed significant results.

A study was conducted to find out the efficacy of Mulligan Mobilization with Movement versus Maitland mobilization in females with osteoarthritis of knee. The outcome measures were WOMAC, goniometer, and VAS. The p value was <0.05. Hence, they concluded that Mulligan mobilization showed more efficacy as compared to Maitland and routine physical therapy in pain and function of knee osteoarthritis.²¹

Another study in agreement was conducted to find out the impact of MWM on pain and function of knee osteoarthritis. VAS and WOMAC scale was used to assess pain and range of motion at knee. The study elicited that the treatment of patients with knee OA with the Mulligan Mobilization was effective as compare to conventional treatment. (36) Current study also showed that P-value reduced from 0.317 to 0.00 from 1st assessment to 4th assessment on between group comparisons. Mean value on VAS value was reduced with time that showed improvement in pain with follow up.

A study was conducted to investigate the immediate effects of Mulligan Mobilization with Movement on pain and functional mobility in knee osteoarthritis. This study proved that the immediate effects of Mulligan mobilization were highly significant in the treatment of knee pain. On the comparison the treatment group demonstrated good outcomes with significant value p<.05. To conclude they reported that Mulligan Mobilization with Movement showed improvement in pain relief and functional mobility.²²

Current study showed better results in MIMG group where mean rank value at WOMAC scale was gradually reduced from 14 to 7 while significant improvement was also seen in mean value of VAS. So

according to current study MIMG showed more significant results as P value was less than 0.05 on between group analysis.

CONCLUSION

The study concluded that Mulligan mobilization showed better results after the 1st follow up but in long term follow up MIMG showed better results. Hence, it was concluded that MIMG showed highly significant in long term effects as compared to the Mulligan Mobilization with movement on pain and function of knee osteoarthritis.

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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