



ORIGINAL RESEARCH PAPER

Physiotherapy

EFFICACY OF MULLIGAN'S MOBILIZATION WITH MOVEMENT IN RESTORATION OF KNEE FUNCTION AMONG SUBJECTS WITH DEGENERATIVE JOINT DISEASE

KEY WORDS:

AN. Bhavani,

BPT VI Semester Department: Faculty Of Physiotherapy Sri Ramachandra University Faculty of Physiotherapy

N.Meenatchi

BPT VI Semester Department: Faculty Of Physiotherapy Sri Ramachandra University Faculty of Physiotherapy

G. Monica

BPT VI Semester Department: Faculty Of Physiotherapy Sri Ramachandra University Faculty of Physiotherapy

Mr Gopalswami A D*

Assistant Professor Department: Faculty Of Physiotherapy *Corresponding Author

ABSTRACT

INTRODUCTION: Knee pain is one of the most common musculoskeletal complaints that seek medical attention (**Journal, Indian Academy of Clinical Medicine, 2013**). The degenerative process causing structural damage to the joint articular cartilage and the subchondral bone is commonly termed as osteoarthritis (**Di Cesare P, et al, 2009**). Obesity and genetic factors are the cause for increased incidence of OA knee. Instability of the knee joint, lower extremity mal alignment, meniscal pathology, heavy weight lifting, repetitive knee movements, specific occupation or sports related stress are the additional risk factors that cause OA knee (**Sridhar MS, et al, 2012**). Progression of the condition shows pathophysiological changes involving the soft tissues around the joint (**Cooper C, Snow S, McAlindon TE et al, 2000**). Osteoarthritis can affect any of the joints in the body, but most commonly affected is the knee joint. Prevalence of Osteoarthritis knee is 7.2% in elderly individuals above 40 years, 12.5% in elderly individuals above 45years and 14.8% in those individuals of 50 years and above. The prevalence of knee OA increases with age after 4th decade of life (**Felson DT, et al, 1987**) (**Bedson J, et al, 2005**)

The common clinical features include pain, stiffness and swelling of the region, movement restriction and impaired ADL. Conventionally OA knee has been treated by use of pain relieving modalities and exercises which has a beneficial effect on the clinical condition outcome of the patients over a period of time, with evolution of other effective means of treating the disorder, manual therapy has been used for the management. Among wide choice of manual therapy approaches, Brian Mulligan's Mobilisation With Movement (MWM), has been proven to be effective for restoration of movement. (**Mulligan BR. Manual therapy. 5th ed. 2003**)

The technique involves a manual force by the therapist, applied in pain free accessory glide along with active movement of the gliding segment. Furthermore MWM is found to be more effective in people with OA knee to improve joint range of motion, reducing pain, joint stiffness and improvement in walking distance. Pain relief is brought about in MWM by biomechanically correcting the faulty positions (**Mulligan B. 2004**).

Henceforth it is aimed to find the efficacy of mobilization with movement along with the conventional treatment in restoring the mobility of knee among subjects with degenerative joint disease. The presence of adequate literature evidence for efficacy of MWM has been considered to utilize the method of treatment for proposed study. (**Mulligan B. 2004**).

MATERIALS AND METHODS

Participants

Study Centre: Physiotherapy outpatient department, SRH Porur, Chennai-116.
Sample size: 40
Study design: Randomized Controlled Trial.

Materials used:

- Mulligan's Mobilization belt,
- Universal Goniometer.

Inclusion criteria:

- Age: 40-60 years.
- Subjects with degenerative joint disease.
- Radiographic evidence of Tibio-femoral compartment degeneration.
- Restricted ROM of knee flexion (90 to 110 degrees).

Exclusion criteria:

- History of knee surgery.

- History of Injury to the knee.
- Instability of knee joint
- Active Infection in the knee.

Methodology:

Patients were recruited from the physiotherapy outpatient department, Sri Ramachandra hospital Porur. The patients had undergone an intake evaluation and those who met the inclusion criteria were informed about the study and informed consent was obtained. A total of 40 subjects with osteoarthritis knee were recruited by simple random sampling method, among which 20 patients were allocated the control group and received conventional treatment (referred treatment with exercise program) for 7 sessions. Remaining 20 patients the intervention group received conventional treatment along with Mulligan's Mobilization With Movement (MWM)

Application of MWM:

Procedure:

The patients in the intervention group were given Mulligan's Mobilization with Movement (MWM) along with the conventional treatment. The duration of the treatment session was 7 days. MWM was administered for 3 days on the 1st, 3rd and 5th day. With patient in supine lying position a sustained lateral glide at the tibiofemoral joint using the mulligan's mobilization belt was given for 3 sets with 8 repetitions.

Outcome measurement:

The outcome measures such as pain, range of motion, and functional activity were obtained prior to and after the intervention for both the groups.

Visual analogue scale (VAS) pain score: was used to measure the pain intensity. It is a 10 cm scale marked by "no pain" and "worst imaginable pain". The patient was asked to plot at the point which represented their pain. The pre and post intervention VAS score was obtained from the patients.

Range of motion (ROM): Active and passive ROM was evaluated during flexion and extension in prone lying using a standard goniometer. The average value was considered for analysis. The pre and post intervention ROM was analyzed.

Knee injury and osteoarthritis outcome scale (KOOS): is a specific instrument used for knee, was used to assess the patients opinion about their knee pain and other problems. It has 5 subscales and these subscales are scored separately KOOS-pain, KOOS-

symptoms, KOOS-ADL, KOOS-sport/recreation, KOOS-QOL. Scores are transformed into 0-100 scale in which 0 represents extreme problem and 100 represents no problem. It is self-administrative and the patient can fill by themselves. Pre and post intervention questionnaire was taken for both the groups. Following intervention and follow up, patients did not report of exacerbation of pain / restriction of mobility following the protocol.

The two-tailed Wilcoxon signed rank test was used to analyse pain score (VAS), knee mobility (ROM) data. Wilcoxon signed rank test was used to analyse KOOS pre and post intervention data. The outcomes obtained for both intervention and control groups (pre and post) was subjected to statistical analysis using SPSS version 19.0 (IBM corporation, New York, USA). The significance level was set at <0.05

DISCUSSION

This study was attempted in order to establish the efficacy of mulligan's mobilization with movement (MWM) for patients with osteoarthritis of knee joint. The variables considered were pain, ROM, and functional status.

The study was to find the efficacy of mobilization with movement (MWM) along with the conventional treatment in restoration of mobility of knee among patients with degenerative joint disease. MWM was proven to be an effective method of treatment for restoration of knee arthrokinematics and realignment of it. (Mulligan BR. *Manual therapy. 5th ed. 2003*)

Primary objective was to evaluate pain with VAS score, and range of motion. The patients had undergone treatment as per said parameters in methodology.

Upon follow up of patient's variable revealed that both the intervention and control groups had improvement in the clinical outcomes. Although, upon analysis statistically, the data revealed that those who belonged to the intervention group had reduction of symptoms (pain) and improved mobility (ROM) well ahead of the control group, by day 2 of treatment. Whereas the control group had responded to treatment in terms of reduction of symptom (pain) and improve mobility (ROM) only by day 4 of treatment.

Within group comparison for both intervention and control group was carried out separately for pain and ROM. The analysis of control group (n=20) revealed that 10% proportion of population had a very mild relief of pain, 40% proportion of population had high relief of pain and 50% proportion of population had moderate relief of pain. In contrast, the data of intervention group revealed that 20% proportion of population at both moderate and minimal relief of pain, whereas 60% proportion of population had complete relief of pain.

All the patients showed significant improvement of ROM (knee flexion) during each visit, which supports the benefits of mobilization with movement (MWM) for osteoarthritis. 65% proportionate of population in the intervention group showed near normal ROM (knee flexion) and 35% proportionate of population showed mild improvement in ROM following MWM. Whereas, only 40% proportionate of population in control group showed moderate improvement in ROM (knee flexion), and 35% proportionate of population showed mild improvement in ROM (knee flexion), 25% proportionate of population had no change in ROM, following conventional treatment.

On comparison of pre and post intervention KOOS of both the groups, the patients in intervention group showed more improvement of all the components (Pain, Symptoms, Activities of Daily Living, Sports/recreation, Quality of Life) than patients in control group.

Reda Abdel Razek, et al (2014) in their study, Efficacy of Mulligan's Mobilization with Movement on Pain, Disability, and Range of Motion in Patients with Knee Osteoarthritis, have reported that for pain intensity and knee range of motion, there were significant differences between groups in favour of the group receiving mobilisation with movement (MWM) with $p < 0.05$ and for disability, there was no significant difference between groups receiving traditional treatment and MWM, therefore it was concluded that MWM should be added to the traditional program for knee osteoarthritis.

The present study showed a significant improvement in Pain and ROM in interventional group compared to the control group. But, in comparison with the above study the ADLoF patients in both the group showed a significant improvement as showed in fig 3& 4. This is in accordance to the study by **Reda Abdel Razek, et al (2014)**.

Following intervention using MWM did not result in any adverse complication. Although few patients had dropped out from the treatment session of both the groups, new patients were recruited in order to replace them. And for most of the patients, the treatment was proven to be effective.

CONCLUSION

LIMITATIONS:

- Small sample size
- Gender was not considered for comparison of variables.

In the present study it is evident that both conventional treatment and Mulligan's Mobilization with movement (MWM) had significant improvement in clinical outcomes in terms of reduction of symptom (pain) and improvement in mobility (ROM) for patients with osteoarthritis of knee joint. However, mulligan's mobilisation technique along with conventional treatment was found to be clinically more effective in restoration of ROM of knee joint (knee flexion) in comparison to patients who had undergone the conventional treatment.

Therefore this study supports evidence to incorporate Mulligan's Mobilisation With Movement (MWM) as a part of treatment regimen for patients with osteoarthritis of knee joint along with the referred treatment.

It may be concluded that, a multi - therapeutic approach including manual therapy and exercise program along with the referred treatment would provide greater benefits to the patients with osteoarthritis of knee joint.

SCOPE FOR FUTURE STUDY:

- Studies may be carried out with a larger sample size and gender variation may be considered for comparison.

REFERENCES:

1. Altman R, Asch E, Bloch D et al. Diagnostic and Therapeutic Criteria Committee of the American Rheumatism Association. Development of criteria for the classification and reporting of osteoarthritis. Classification of osteoarthritis of the knee. *Arthritis Rheum* 1986; 29(8): 1039-49.
2. Atlas of Osteoarthritis. Springer. 2015. p. 21. ISBN 9781910315163.
3. Bedson J, Jordan K, Croft P. The prevalence and history of knee osteoarthritis in general practice: A case control study. *Fampract* 2005; 22(1): 103-108.
4. Collins N, Teys P, Vicenzino B. The initial effects of a Mulligan's mobilization with movement technique on dorsiflexion and pain in subacute ankle sprains. *Manual Therapy* 2004; 9:77-82.
5. Cooper C, Snow S, McAlindon TE et al. Risk factors for the incidence and progression of radiographic knee osteoarthritis. *Arthritis Rheum* 2000; 43(5): 995-1000.
6. Deyle GD, Allison SC, Matekel RL, Ryder MG, Stang JM, Gohdes DD, Hutton JP, Henderson NE, Garber MB 2005 Physical therapy treatment effectiveness for osteoarthritis of the knee: a randomized comparison of supervised clinical exercise and manual therapy procedures versus a home exercise program. *Physical Therapy* 85: 1301-1317.
7. Di Cesare P, Abramson S, Samuels J. Pathogenesis of osteoarthritis. In: Firestein GS, Kelley WN, eds. *Kelley's Textbook of Rheumatology*. 8th ed. Philadelphia, Pa.: Saunders Elsevier; 2009: 1525-40.
8. Dimitrova E. Efficacy of mobilizations with movement in patients with knee osteoarthritis. *Sport Medicine Journal* 2008; 16(4).
9. Ewa M Roos and Stefan Lohmander 2nd November 2003. Health and quality of life outcomes 2003.
10. Felson DT, Naimark A, Anderson J, Kazis L, Castelli W, Meenan RF. The prevalence of knee osteoarthritis in the elderly: the Framingham Osteoarthritis Study. *Arthritis Rheum*. 1987; 30:914-918.
11. Felson DT, Zhang Y, Hannan MT et al. Risk factors for incident radiographic knee osteoarthritis in the elderly: the Framingham Study. *Arthritis Rheum* 1997; 40(4): 728-33.
12. Gail D. Dyle, Nancy E. Henderson, Robert L. Matekal, et al. Effectiveness of Manual Physical Therapy and Exercise in Osteoarthritis of knee joint.- A Randomized, Controlled Trial. *Ann Intern Med*. 2000; 132(3):173-181.
13. Jansen MJ, Viechtbauer W, Lenssen AF, Hendriks EJM, de Bie RA 2011 Strength training alone, exercise therapy alone, and exercise therapy with 3 passive manual mobilization each reduce pain and disability in people with knee osteoarthritis: a systematic review. *Journal of Physiotherapy* 57: 11-20.
14. Journal, Indian Academy of Clinical Medicine Vol. 14, No. 2 April-June, 2013
15. Kaprio J, Kujala UM, Peltonen L, Koskenvuo M. Genetic liability to osteoarthritis may be greater in women than men. *BMJ* 1996; 313(7051): 232.
16. Lee R, Kean WF. Obesity and knee osteoarthritis. *Inflammo pharmacology* 2012; 20(2): 53-8.
17. Leighann Litcher Kelly, et al. A systematic review of measures used to assess chronic musculoskeletal pain in clinical trials. *Journal of pain*. 2007; 8(12):906-913.
18. Mulligan B. *Manual Therapy: "NAGS", "SNAGS", "MWMs" etc.* 5th ed. Wellington: Plane View Services Ltd., 2004.