

Articular mobilizations for knee OA, to do or not to do – Narrative Review

Ajit S Dabholkar¹, Tejashree A Dabholkar¹

Abstract

Background: Osteoarthritis (OA) is a common progressive joint disease, involving not only the joint lining but also cartilage, ligaments, and bone. Knee osteoarthritis is a highly prevalent condition with a significant socioeconomic burden to society. It is known to affect sufferers through pain, loss of function and changes in health related quality of life. Management typically involves pharmacologic and/or exercise based therapy approaches to reduce pain. Previous studies have shown multimodal treatment approaches incorporating manual therapy to be efficacious.

Objectives: To appraise the literature by summarizing the findings of current evidence in manual therapy for knee osteoarthritis.

Methodology: Relevant full text articles focusing on joint mobilization of knee osteoarthritis were searched by using Boolean operator “and” using the terms 'knee', 'osteoarthritis' and 'manual/ manipulative therapy and knee mobilization' limited to humans. Databases like PubMed, Cochrane and Google scholar were reviewed for references. Articles included were current clinical practice guidelines, Systematic Reviews, Randomised controlled trials, Case Series and Literature review. In addition, the reviewers manually checked for any articles in peer reviewed journals.

Results: The studies revealed that Manual therapy in osteoarthritis knee have favourable response and can be administered as a sole treatment or as an adjunctive treatment for effective patient care.

Conclusions: The current evidence base is encouraging of the notion that manipulation/manual therapy is effective in treatment of knee osteoarthritis patients.

Key words: Osteoarthritis, knee pain, manual therapy, mobilization, manipulation

Introduction:

Musculoskeletal conditions are the most common cause of chronic disability around the world. The importance of musculoskeletal conditions as a cause of mortality and morbidity has been recognized by the designation of 2000–10 as the Bone and Joint Decade by the United Nations [1], World Health Organization (WHO), and more than 60 countries around the world. WHO (2003,2004) [2,3] has highlighted the burden of musculoskeletal conditions. Estimates of the global burden of these conditions have increased 25% over the past decade (WHO 2000) [4]

Osteoarthritis is increasing among the world's aging populations and is the sixth leading cause of years lost because of disability

globally. It accounts for nearly 3% of the total global years lost to disability, and 10 % of men and 18% of women over the age of 60 have OA.

Osteoarthritis is the most common form of arthritis and one of the leading causes of pain and disability worldwide (NICE, 2008; Reginster, 2002) [5,6]. It is characterised by a progressive loss of articular cartilage, joint space narrowing, sclerosis of subchondral bone and osteophyte formation. Soft tissues such as the capsule can undergo soft tissue contracture and fibrosis [7]. These changes can result in pain, impaired mobility, reduced muscle strength, limitation in activities of daily living [8,9] and reduced quality of life [10] with the knee and hip joints most commonly affected

patients with osteoarthritis [8, 11].

Manual therapy is a physical treatment used by physiotherapists, chiropractors, osteopaths and other practitioners to treat musculoskeletal pain and disability, and includes massage therapy, joint mobilisation and manipulation.

Recently published clinical guidelines on the management of OA recommended manual therapy as an adjunctive therapy to exercise for OA. (NICE, 2008 [5]; RACGP, 2009 [12]). A requirement also exists for simple and inexpensive treatment protocols to fill the void between medication, exercise and surgery. Thus, this narrative review gives a comprehensive review on current evidence in joint mobilization in OA knee

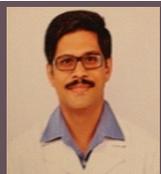
Restricted joint mobility, especially in terms of knee flexion, appears to be an important determinant of disability in

Searches and selection : Peer reviewed journal articles that predominantly focussed on joint mobilization in knee OA were included in this review. The articles were identified via a search of PubMed, Cochrane library and Google Scholar. All types of articles, including primary research and review reports were included. Reference lists

¹School of Physiotherapy, DY Patil University, Nerul, Navi Mumbai-400706

Address of Correspondence

Dr. Ajit Dabholkar
School of Physiotherapy, DY Patil University,
Nerul, Navi Mumbai-400706
Email: ajitdabholkar78@yahoo.co.in



Dr Ajit Dabholkar
(PT)



Dr Tejashree
Dabholkar (PT)

© 2017 by Journal of Evidence-Based Physiotherapy and Research | Available on www.evidencephysiotherapy.com |

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Table 1: Salient Features of Literature Review

Author	Treatment	Pain	Function
Deyle GD et al ¹³ 2000	Multimodal approaches utilizing a combination of exercises and individualized manual therapy (received twice weekly for 4 weeks) has resulted in significant improvements in knee pain and function when compared to a placebo therapy of sub-therapeutic ultrasound in both the short term and long term follow up.	+	+
Deyle GD et al ¹⁴ 2005	Another trial compared clinic based treatment incorporating supervised exercise, individualized manual therapy and a home exercise program over a four week period to a home exercise program. The results indicated that in both group's knee pain decreased and function improved in the short and long term.	+	+
Tucker M et al ¹⁵ 2003	Another randomised controlled trial investigated high velocity thrust techniques (received 8 times over 3 weeks) to the knee compared with NSAIDs. They found no objective or subjective differences between the groups; both were equally effective. Therefore, use of manual therapy should be offered as an alternative to pharmaceutical administrations.	+	+
Moss P et al ¹⁶ 2007	AP mobilization of the tibio femoral (TF) joint resulted in significantly increased pressure pain threshold (lowest stimulus at which mechanical pain was perceived) and reduced timing on the 3 m timed 'up-and-go' walk test.	+	+
Pollard. H et al ¹⁷ 2008	A short-term manual therapy knee protocol significantly reduced pain suffered by participants with osteoarthritic knee pain and resulted in improvements in self-reported knee function immediately after the end of the 2 week treatment period.	+	+
Mutlu EK et al ¹⁸ 2014	Manual therapy is highly effective and useful treatments for knee osteoarthritis. It is a common observation that exercise therapy can be combined effectively with manual therapy. In knee OA (exterior or interior), mobilization of the tibia-femoral joint, patella, and manual traction can be taken into consideration.	+	? +
Chan-Woo Nam et al ¹⁹ 2013	Treatment of degenerative osteoarthritis patients using the MWM technique is effective for reducing pain and improving physical functions.	+	+
Maher S et al ²⁰ 2010	The results of this case series lend support for the use of manual TF joint traction as a means of stretching shortened articular and periarticular tissues without increasing reported levels of pain either during or at the end of treatment. This is the first study documenting the temporal aspects of treatment effectiveness in motion restoration.	?	?
Fish et al ²¹ 2008	The authors showed favourable responses in both treatment groups, with no statistically significant difference between the results of them. According to the results presented by Fish et al, it seems that the mobilisation of the knee joint is better than placebo for treating knee OA.	+	+
Takasaki H et al ²² 2013	MWM was associated with immediate pain relief and improved knee function, suggesting its potential as a component of early management of knee OA	+	+

+, evidence of benefit

-, no evidence of benefit

?, inconclusive evidence or no available data

from identified articles and additional citations of interest located manually were also searched. The articles selected should be available in full text and only Human studies were selected. The comprehensive details of the related articles on articular mobilizations in osteoarthritis of knee are included in table 1 [13 - 23]

Discussion and Conclusion:

The small number of included studies indicates the limited research to date. All studies were heterogeneous regarding the types of manual therapy and comparison interventions used. Findings suggest that manual therapy may have a beneficial short-term effect in reducing pain and improving physical function for patients with knee OA compared with no intervention. A recent systematic review and meta-analysis revealed that the findings in the present meta-analytical review support the use of manual therapy versus a number of different comparators for improvement in self-reported knee function. Lesser support is present for pain reduction, and no endorsement of functional performance can be made at this time [23].

Although, a systematic review revealed that there is less convincing evidence from three studies included in this review on manual therapy on OA knee with a high risk of bias that manual therapy has favourable outcome. The knee OA studies had variable results: one study showed no group differences for pain and function; one showed larger effects for the manual therapy group for both pain and function and the third favoured manual therapy for function but no group differences for pain [24].

In view of clinical practice guidelines/ Literature????

A systematic review of recommendations and guidelines for the management of osteoarthritis highlighted that Exercise in combination of Manual therapy is effective in treatment of OA knees [25]. Also, the literature review suggests that manual therapy of the knee and full kinetic chain (SI or foot) can be combined with multimodal/exercise therapy [26].

Effect on Knee cartilage:

An interesting study of Du N et al highlighted manipulation is effective in treatment of knee osteoarthritis by decreasing the maximum defect diameter and increasing the volume of knee cartilage [27].

Role of Multimodal treatments:

Patients with knee osteoarthritis may improve their pain, stiffness and physical function with sustained physical exercise, manual therapy or both, according to new research findings. This study showed that benefits imparted by a comprehensive program of exercise therapy or manual therapy, provided by Physical Therapists; remain significant to at least two years follow-up [28]. Jansen et al [29] recommended exercise therapy plus manual mobilisation showed a moderate effect size on pain compared to the small effect sizes for strength training or exercise therapy alone. To achieve better pain relief in patients with knee osteoarthritis physiotherapists or manual therapists might consider adding manual mobilisation to optimise supervised active exercise programs. Jansen 2011, Meta-analysis Knee OA; 12 studies, Meta-regression suggests manual therapy and exercise (ES=0.69) may have a larger effect in relieving pain than strengthening (ES=0.38) or exercise alone (ES=0.34) in the short-term; however, confidence intervals were wide and overlapped. American college of

Rheumatology (2012) recommends Manual therapy in combination with exercise supervised by physiotherapist [30]. A regimen consisted of manual therapy together with resistive exercises appears to be more effective at improving muscle strength, proprioception and functional performance than resistive exercise alone [31]. Thus, we conclude that manual therapy can be effective in the management of patients with OA knee. The extent, to which these

treatments are effective in managing symptoms and slowing disease progression, remains to be proven. A limitation of the current review may be that only few databases were searched. Other databases could have been searched in order to broaden the review and not to overlook other guidelines and/or references for manual therapy in the treatment of knee osteoarthritis. Lapane et al's conclusion is quite appropriate

for this review as a whole. The current evidence base is encouraging of the notion that manipulation/manual therapy is helpful in osteoarthritis patients. It is also encouraging to see new and more sophisticated studies being planned in the protocols cited above. Hopefully, this will lead to greater acceptance and utilization of this form of therapy in osteoarthritis patients.

References

- Hazes M., Woolf A. D. The Bone and Joint Decade 2000–2010. *Journal of Rheumatology*. 2000; 27:1–3.
- WHO (World Health Organization). 2000. "Global Burden of Disease." Global Programme on Evidence for Health Policy Discussion Paper 50, WHO, Geneva.
- "The Burden of Musculoskeletal Conditions at the Start of the New Millennium." WHO Technical Report Series 919, WHO 2003, Geneva.
- Annex 3: Burden of Disease in Disability-Adjusted Life-Years (DALYs), by Cause, Sex, and Mortality Stratum, in WHO Regions, Estimates for 2001. Geneva: WHO 2004. <http://www.who.int/whr/2002/annex/en/print.html>.
- NICE (National Institute of Clinical Excellence). The care and management of osteoarthritis in adults, <http://www.nice.org.uk/nicemedia/pdf/CG59NICEguideline.pdf>; 2008 (accessed 31/01/2017)
- Reginster JY. The prevalence and burden of arthritis. *Rheumatology* 2002;41 (Suppl. 1):3-6
- Cameron HU, Macnab I. Observations on osteoarthritis of the hip joint. *Clinical Orthopaedics and Related Research* 1975;108:31-40
- Stueltjens MP, Dekker J, van Baar ME, Oostendorp RA, Bijlsma JW. Range of joint motion and disability in patients with osteoarthritis of the knee or hip. *Rheumatology* 2000;39(9):955-61.
- Stueltjens MP, Dekker J, van Baar ME, Oostendorp RA, Bijlsma JW. Muscle strength, pain and disability in patients with osteoarthritis. *Clinical Rehabilitation* 2001;15(3):331-41
- Salaffi F, Carotti M, Grassi W. Health-related quality of life in patients with hip or knee osteoarthritis: comparison of generic and disease-specific instruments. *Clinical Rheumatology* 2005;24(1):29-37
- Odding E, Valkenburg HA, Algra D, Vandenouwendland FA, Grobbee DE, Hofman A (1996) The association of abnormalities on physical examination of the hip and knee with locomotor disability in the Rotterdam Study. *British Journal of Rheumatology* 35: 884–890.
- RACGP (Royal Australian College of General Practitioners). Guideline for the nonsurgical management of hip and knee osteoarthritis, <http://www.racgp.org.au/guidelines/osteoarthritis>; 2009 (accessed 31/01/2017).
- Deyle GD, Henderson NE, Matekel RL, et al. Effectiveness of manual physical therapy and exercise in osteoarthritis of the knee. A randomized, controlled trial. *Ann Intern Med*. 2000;132(3):173–181.
- Deyle GD, Allison SC, Matekel RL, et al. 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. *Phys Ther*. 2005;85(12):1301–1317.
- Tucker M, Brantingham JW, Myburg C. Relative effectiveness of a non-steroidal anti-inflammatory medication (Meloxicam) versus manipulation in the treatment of osteoarthritis of the knee. *Eur J Chiro*. 2003;50:163–183.
- Moss P, Sluka K, Wright A. The initial effects of knee joint mobilization on osteoarthritic hyperalgesia. *Man Ther* 2007;12: 109–18
- Pollard H, Ward G, Hoskins W, Hardy K. The effect of a manual therapy knee protocol on osteoarthritic knee pain: a randomised controlled trial. *J Can Chiropr Assoc*. 2008 Dec; 52(4): 229–242.
- Mutlu EK, Ozdincler AR. Manual Therapy for Knee Osteoarthritis. *Phys Med Rehabil Int*. 2014;1(4): 2
- Nam CW, Park SI, Yong MS, Kim YM. Effects of the MWM Technique Accompanied by Trunk Stabilization Exercises on Pain and Physical Dysfunctions Caused by Degenerative Osteoarthritis. *J Phys Ther Sci*. 2013 Sep; 25(9): 1137–1140
- Maher S, Creighton D, Kondratek M, Krauss J, Qu X. The effect of tibio-femoral traction mobilization on passive knee flexion motion impairment and pain: a case series. *J Man Manip Ther*. 2010 Mar; 18(1): 29–36
- Fish D, Kretzmann H, Brantingham JW, Globe G, Korporaal C, Moen J. A Randomized Clinical Trial to Determine the Effect of Combining a Topical Capsaicin Cream and Knee Joint Mobilization in the Treatment of Osteoarthritis of the Knee. *Journal of American Chiropractic Association* 2008; 45: 8-23.
- Takasaki H, Hall T, Jull G. Immediate and short-term effects of Mulligan's mobilization with movement on knee pain and disability associated with knee osteoarthritis—a prospective case series. *Physiother Theory Pract*. 2013 Feb; 29(2):87-95
- Salamh P, Cook C, Reiman MP, Sheets C. Treatment effectiveness and fidelity of manual therapy to the knee: A systematic review and meta-analysis. *Musculoskeletal Care*. 2016;1-11
- French HP, Brennan A, White B, Cusack T. Manual therapy for osteoarthritis of the hip or knee systematic review. *Man Ther* 2011;16:109-17.
- Nelson AE, Allen KD, Golightly YM, Goode AP, Jordan JM. A systematic review of recommendations and guidelines for the management of osteoarthritis: The Chronic Osteoarthritis Management Initiative of the U.S. Bone and Joint Initiative. *Seminars in Arthritis and Rheumatism*. 2014;43:701-712
- Brantingham JW, Bonnefin D, Perle SM, Cassa TK, Globe G, Pribicevic M, et al. Manipulative therapy for lower extremity conditions: update of a literature review. *J Manipulative Physiol Ther*. 2012; 35: 127-166
- Du N, Lu Y, Gu X, Hu J. Magnetic resonance assessment the effect of manipulation on knee cartilaginous recovery of osteoarthritis. *Zhongguo Gu Shang*. 2008 Nov;21(11):824-7.
- Abbott JH, Robertson MC, McKenzie JE, Baxter GD, Theis JC, Campbell AJ et al. Exercise therapy, manual therapy, or both, for osteoarthritis of the hip or knee: a factorial randomised controlled trial protocol. *Trials* 2009, 10:11
- Jansen MJ, Viechtbauer W, Lenssen AF, Hendriks EJ, de Bie RA. Strength training alone, exercise therapy alone, and exercise therapy with passive manual mobilisation each reduce pain and disability in people with knee osteoarthritis: a systematic review. *J Physiother*. 2011; 57: 11-20.
- Hochberg MC, Altman RD, April KT, Benkhalti M, Guyatt G, McGowan J, et al. American College of Rheumatology 2012. Recommendations for the Use of Non-pharmacologic and Pharmacologic Therapies in Osteoarthritis of the Hand, Hip, and Knee. *Arthritis Care & Research* Vol. 64, No. 4, April 2012, pp 465–474
- Ko T, Lee S, Lee D. Manual therapy and exercise for OA knee: Effects of muscle strength, proprioception and functional performance. *J Phy Ther Science*.2009;21:293-299.
- Lapane KL, Sand MR, Yang S, McAlindon TE, Eaton CB. Use of complementary and alternative medicine among patients with radiographic confirmed knee OA. *Osteoarthritis Cartilage*.2012;20:22-28.

Conflict of Interest: NIL
Source of Support: NIL

How to Cite this Article

Dabholkar AS & Dabholkar TA. Articular mobilizations for knee OA, to do or not to do – Narrative Review. *J Evidence-Based Physio Research* March - June 2017; 1(1): 7-9.