



A STUDY ON THE CLINICAL EFFICACY OF KINESIO TAPING ON PAIN AND FUNCTION IN STAGE-II KNEE OSTEOARTHRITIS

¹Chandra Shekhar Kumar, ²Neha Shukla and ³Digvijay Sharma

^{1,2,3}Assistant professor, UIHS, CSJM University, Kanpur

ABSTRACT

Objective: The aim of current study was to see the clinical efficacy of kinesio taping on pain & function in stage-II knee osteoarthritis.

Method: A total of 60 patients were categorized into two groups: control group (N=30) & intervention group (N=30). Control group patients were received conventional physiotherapy & intervention group patients were received conventional physiotherapy plus kinesio taping. All patients were given treatment three times per week which was continued for four weeks. Pain was measured using visual analog scale & functional evaluation was conducted using Korean Western Ontario and MacMaster Universities Osteoarthritis Index.

Result: There was significant decrease in VAS and K-WOMAC score in kinesio taping group (KTG) than conventional treatment group (CTG) after four weeks of treatment.

Conclusion: Kinesio taping plus conventional physiotherapy is more clinically effective than conventional physiotherapy alone in terms of reducing pain & improving function in patients with stage-II knee osteoarthritis.

INTRODUCTION

Knee osteoarthritis (OA) is a most common musculoskeletal condition that affect older people.ⁱ It is a degenerative joint disease that affect articular cartilage & subchondral bone. Common characteristics of OA are pain, stiffness, swelling, joint instability & muscular weakness that not only diminish daily activities but also affects the quality of life for the reason that pain limits movements such as walking, squatting, ascending & descending stairs. Due to weight bearing & repeated movement knee joint suffers OA more than any other joints of the body.ⁱⁱ Recent management focuses on both pharmacological & non pharmacological treatment approaches for knee OA.ⁱⁱⁱ Physiotherapy is non pharmacological intervention for knee joint OA recommended by the American College of Rheumatology and European League Against Rheumatism.ⁱ Physiotherapy treatment approach for knee OA include exercises, manual therapy, hydrotherapy & therapeutic taping. Physical modalities are also used as adjunct treatment for reducing pain in short time.



Clinically OA is defined by presence of pain & radiographic joint degeneration. This is commonly graded on radiograph using Kellgren & Lawrence scale.^{iv} There are five grades of OA ranging from 0 (none) to IV (severe).

Kinesio tape (KT) was developed by a Japanese chiropractor Kenzo Kase in 1979. It is a hypoallergic, breathable & waterproof & can be worn upto 3-5 days. Application of KT has been shown many benefits such as decreasing pain & supporting the knee joint that improve range of motion & promote healing process.ⁱⁱ The main purpose of our study was to find the effectiveness of KT exclusively in stage-II knee OA.

METHODOLOGY

Sample: A sample of 60 patients suffering from stage-II knee OA took part in this study. All the subjects were selected from physiotherapy out patient department of university institute of health sciences CSJM university Kanpur. All the patients had been diagnosed with stage - II knee OA based on clinical findings & X-rays by orthopedician. All the processes & purposes of the study were fully explained to the patients. Voluntary agreement for participation was obtained by the patient before experiment.

Inclusion criteria: Both male & female patients who had unilateral knee joint OA with pain & whose radiographs were showing definite osteophytes & possible joint space narrowing (stage-II OA) were included in this study.

Exclusion criteria: Patients who had undergone knee joint surgery, joint replacement, arthroscopic surgery, intra articular steroid injection & severe OA (stage III and IV) with definite bone deformity were excluded from the study.

The intervention programs: All the 60 patients were divided into two groups: the conventional treatment group (CTG, N=30) & kinesio taping group (KTG, N=30). The CTG received conventional physiotherapy like hydrocollator pack for 20 minutes, IFT for 15 minutes & quadriceps muscle strengthening exercises. The KTG were received the same conventional physiotherapy followed by kinesio taping. All the subjects were treated three times per week for four weeks.

Before applying kinesio tape (KT) the area to be treated was shaved, cleaned & checked. All the patients qualified for this study were checked for KT allergic test. This taping method consist of three strips (two 'Y' strips & one 'I' strip). The 'Y' strips are about 13 cm in length & 'I' strip is about 11 cm. The anchor portion of tape is about 4 cm in length. All bases & ends (middle portion) of the strips were applied with paper off tension. Between the

bases & ends desired tension was applied. During the treatment patient position was supine lying. The first ‘Y’ strip represents the quadriceps muscle and in maximum knee flexion the tails of the strip wrap the patella medially & laterally with 50% tension. The second ‘Y’ strip was applied between tibial tuberosity & inferior pole of the patella in 90° flexion. The ‘I’ strip was applied to the patella medio-laterally with 50% tension in 30° knee flexion. During each treatment session the tapes were replaced.**Error! Bookmark not defined.**

Visual analog scale (VAS) was use to assess pain & K-WOMAC (Korean Western Ontario &MacMaster Universities Osteoarthritis Index) was used for assessing the functions of daily living activities. The K-WOMAC index is questionnaire for evaluation of treatment results in patient with lower limb osteoarthritis.This index devides difficulties of activities of daily living in scales. Pain & difficulties in performance of daily living activities were measured by using VAS & K-WOMAC index before & after the treatment to evaluate the changes felt by the patients.

In this study for data analysis independent t-test were used to analyze intergroup comparison & paired t-test were used to examine intragroup changes. SPSS/PC ver. 13 was used for statistical analysis &results were considered statistically significant if p value was less than 0.05.

Result: The result of present study showed that intragroup comparison of CTG & KTG revealed that the VAS & K-WOMAC scores were significantly decreased & intergroup comparison revealed that KTG showed significantly lower VAS & K-WOMAC sores than the CTG.

Comparison of VAS & K-WOMAC between groups:

	GROUP	PRE	SD	POST	SD
VAS (points)	CTG	7.5	1.2	5.2	1
	KTG	7.4	1.1	3.6	1.1
K-WOMAC (Points)	CTG	44.3	13.9	38.2	10.5
	KTG	45.6	12.1	30.1	5.3

VAS:Visual analog scale; K-WOMAC: Korean Ontario &MacMasterUnive-
rsities Osteoarthritis Index ; CTG: Conventional treatment group; KTG: Kin-
esio taping group. p value <0.05was considered as statistically significant

DISCUSSION

There is a great number of personal and social consequences of OA. In OA, knee joint is most commonly associated with clinical symptoms & disability.^v Though there are many studies which shows that the conventional physiotherapy management reduces pain in patient with knee OA but here our main intention was to find the effects of KT on pain & function exclusively in stage-II knee OA. The advantage of KT is, it gives reduction in pain quickly. Also the tape is inexpensive measure to reduce the pain .Once the patient learn the technique of application he/she can apply the tape at home as home program.

Cushnaghan et al. in (1994) found that medial taping of patella significantly reduce pain in patient with knee OA as compared to the lateral taping.^{vi} Lee et.al found that application of tape to vastus medialis oblique & vastus lateralis in patient with knee OA reduces the pain. The maximum isometric contractile force of individual muscle was increased & the activity of individual muscle was decreased during ascending & descending stairs.^{vii} Melzeck R & P.D Wall. in (1965) suggested that therapeutic taping may provide neural inhibition via large fiber input to the anterior knee & because of these inputs sensory signals are transmitted faster to the brain than the pain signals so it will cause reduction in the pain. Basically they said that large fiber input override the pain signals that will lead to reduction in pain due to therapeutic taping.^{viii} In the present study VAS showed that pain was significantly reduced in KTG.

When KT is applied with tension it activate the mechanoreceptors and causing the impulses to reach the brain. Hence the muscle tone abnormality that is the causing factor of the cartilage degeneration is regulated. Resultant is reducing pain & improving function of OA knee.ⁱⁱ

Both KTG & CTG were benefitted by the conventional physiotherapy but KTG showed statistically better improvement than CTG in intergroup analysis by means of VAS & K-WOMAC. Therefore it can be concluded that KT plus conventional physiotherapy is more effective than conventional physiotherapy alone.

CONCLUSION

The findings of this study support that the kinesio taping reduces pain & improve functions in patient with stage-II knee osteoarthritis. Significant pain reduction and improvement in activities of daily living was found in patients treated with kinesiotaping. There were also reduction in analgesic consumption of the patients. Hence kinesio taping can be used as an



adjunct for knee OA especially in stage-II. Further study is required to find the effectiveness of kinesio taping in other stages of knee OA.

REFERENCES

1. Bennell, K. L., Hinman, R. S., Metcalf, B. R., Buchbinder, R., McConnell, J., McColl, G., ... & Crossley, K. M. (2005). Efficacy of physiotherapy management of knee joint osteoarthritis: a randomised, double blind, placebo controlled trial. *Annals of the rheumatic diseases*, 64(6), 906-912.
2. Nwe, A. A., Tun, M. T., Aung, S. T., & Myaing, K. T. (2019). Effectiveness of Kinesio taping in the management of knee osteoarthritis. *Journal of Advances in Medicine and Medical Research*, 1-10.
3. Richette, P., Sautreuil, P., Coudeyre, E., Chevalier, X., Revel, M., & Rannou, F. (2008). Usefulness of taping in lower limb osteoarthritis. French clinical practice guidelines. *Joint bone spine*, 75(4), 475-478.
4. Faqih, A., Gavankar, U., Tambekar, N., Rairikar, S., Shyam, A., & Sancheti, P. (2015). Effect of rigid taping on pain and gait parameters in knee osteoarthritis. *International Journal of Current Research and Review*, 7(1), 24.
5. David T, Felsen DT, Naimark, Jennifer Anderson, Lewis Kzis, Wiilium, Castell and Robert F. Meenan (1987); The prevalence of knee osteoarthritis in the elderly, the Framingham study; *Arthritis and Rheumatism*; 30 (8); 914-918.
6. Janet Cushnaghan, Conor McCarthy, Paul Dieppe, (1994), Taping the patella medially, A new treatment for osteoarthritis of knee joint, *British Medical Journal*, 308, 753-755.
7. Lee, K., Yi, C. W., & Lee, S. (2016). The effects of kinesiology taping therapy on degenerative knee arthritis patients' pain, function, and joint range of motion. *Journal of physical therapy science*, 28(1), 63-66.
8. Ronald Melzeck and Patrick D. Wll, (1965), Pain mechanism- A new pain theory , *Science*, 150 (19) 971-978.