



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(2): 301-305
www.allresearchjournal.com
Received: 18-12-2016
Accepted: 19-01-2017

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Effects of kinesiotaping on osteoarthritis of knee in geriatric population

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Abstract

Objective: To study the effect of kinesiotaping on osteoarthritis of knee in geriatric population.

Design: Randomized control trial.

Setting: Department of community Physiotherapy, Pravara Rural Hospital, Loni.

Method: 30 participants with clinically diagnosed OA were divided into 2 groups (Experimental and Control group). Participants in Experimental group received kinesiotaping along with standard conventional physiotherapy. Participants in Control group received only standard conventional physiotherapy. Both the groups were treated for 3 week. NRS scale, TUG, WOMAC scale was used in participants with osteoarthritis.

Result: On comparing between the groups, it was observed that there is statistically significant between the two groups of pain assessed on NRS. In WOMAC participants of both groups was highly significant and very significant it is used to assess pain, stiffness, and physical function. The physical mobility in the participants was screened using TUG. On comparing in both groups it was highly significant and not quite significant.

Conclusion: The study concluded that the experimental group showed more improvement than control group so it can be started that conventional physiotherapy with kinesiotaping has beneficial effects in participants osteoarthritis of knee.

Keywords: Osteoarthritis of knee, TUG, WOMAC scale

Introduction

Osteoarthritis (OA) is the most common form of degenerative joint disease affecting 15 to 40% of people aged 40 and above. The knee joint is most frequently affected by osteoarthritis. OA knee is two times more prevalent than OA hips in people aged over 60 years. Females are more affected than males. The quadriceps groups of muscles such as rectus femoris, vastus medialis, vastus lateralis, vastus inter medialis muscles plays an important role in controlling knee motion, providing stability, and attenuating impact loading. While quadriceps weakness is often the focus on tibiofemoral OA rehabilitation. It affects the entire joint, including bone, cartilage, ligament, and muscle. Knee OA also may develop as a secondary condition following a traumatic knee injury. Depending on the stage of the disease and whether there are associated injuries or conditions, knee OA can be managed with physical therapy [1]. OA can be treated by modalities, exercises, orthopedic appliances, taping, joint protective techniques and instruction about activities of daily living ; in which taping can be used to reduce pain in knee osteoarthritis. Kinesiotape is an elastic, adhesive-backed cotton tape. Kinesiotaping is also suggested to reduce injury recovery time by decreasing pain and inflammation [6]. It is air permeable, channels away moisture and assists in water evaporation [6]. Kinesiotaping allows a partial to full ROM to applied muscles and joints [8]. As a result, kinesiotaping reduces pain, swelling, and muscle spasm [9].

Methodology: participant were selected according to inclusion and exclusion criteria and those who met the inclusion criteria were included in the study.

Inclusion criteria

- Both male and female with OA of knee
- Age more than 60 years
- Subjects willing to participate
- Participant having knee pain more than 6 months

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- Participant with unilateral or bilateral involvement of knee
- Willingness to participate in the study.

Exclusion criteria

- Participants with inflammatory joint disease of lower extremity, neurological disorder (motor and sensory loss) cardiac or metabolic condition.
- Participants involved in any form of exercise for lower extremity for at least 3 months;
- Participants taking any intraarticular injection for knee, for last 6 months.
- Patient with history of recent surgery to hip, knee, ankle joint involving ligament, meniscus,
- Participant with balance problem.

All 30 participants of OA knee were randomly assigned to two groups; control Group [group A]; received conventional PT (n=15) and Group B: experimental group received kinesiotaping plus conventional PT (n=15) and this allocation was done by using simple random sampling. The pre-intervention outcome measures consisted of pain assessment using numerical pain rating scale(NPRS), was assessed by using knee functional disability was assessed by using modified- Western Ontario McMaster (m. WOMAC).

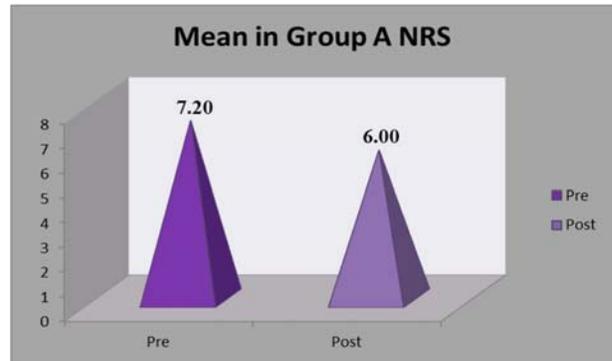
Control group (Group A): The control group participant was received 1) Isometric Exercises for quadriceps each set of exercises consist of 10 repetitions [1rep=5sec hold, 10 repX3set]. 2) straight leg raising[SLR](10 rep,3sets), 3) Hip abductors strengthening (10 rep,3sets), exercise training(10 rep,3sets),prone knee bending exercise, hip extension exercise. The progression was done when participant was eased to do exercises either by increasing repetition or frequency of exercises. 5) Self Hamstring stretching (static) (3sets, each stretch30 sec hold, between each set 5sec rests).3 therapy sessions per week, each session was 30minutes duration & for 3 weeks.

Experimental group (Group B): The Kinesiotape was applied with approximately 40% stretch of its maximal length on the 2 quadriceps group muscles based on the principle of activation technique. Here the direction of taping was applied origin to insertion of the muscles. Taping protocol was designed based on the principle of activation technique. Kinesiotape was applied on the 2 quadriceps muscles for rectus femoris [RF] ‘Y’strip was applied, 10cm bellow the anterior inferior iliac spine to the inferior border of the patella and 2) for vastus medialis [VM], the KT was applied 10cm bellow the intertrochanteric line to the medial border of the patella. Patient was positioned in supine with knee bending.

Also, according to Kase Wallis principles of KT, a gap of at least 30 min was given after the tape application to achieve a complete activation of the glue, which is believed to improve the performance of the kinesiotape on the quadriceps muscle. 3 therapy sessions per week [working alternative days], for total 3 weeks. After applied KT, all the OA knee study participant.

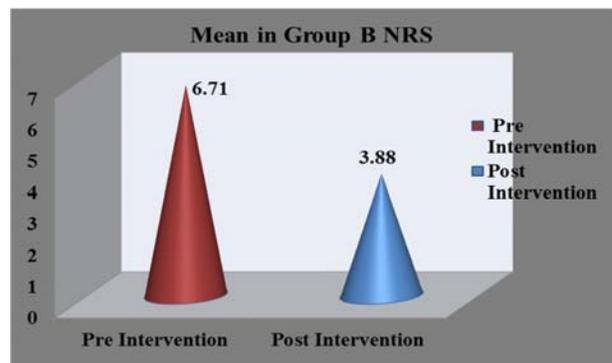
Results and Discussion

1 This graph shows Mean of pain relief in group A on NRS



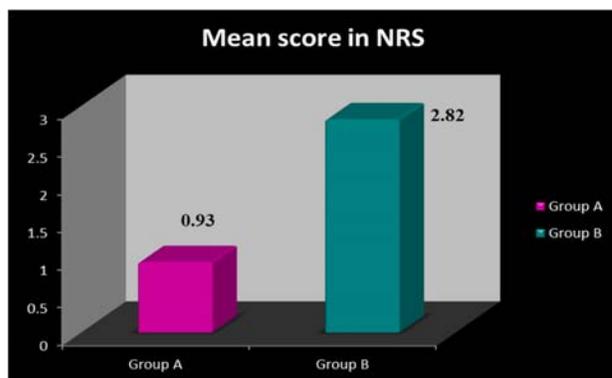
Graph 1: Above graph represents pre and post mean in group A on NRS p value is <0.0012 and t value is 4.0540; which is very significant.

2 This graph shows mean of pain relief in group B on NRS



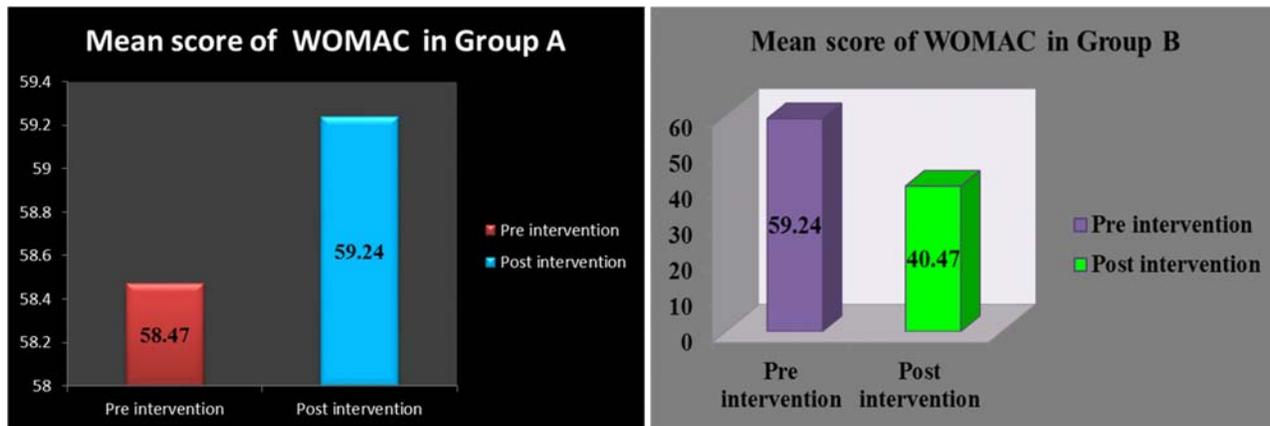
Graph 2: Above graph represents Comparison of pre and post mean in group B using paired t test in which p value is <0.0004 and t value is 4.4712; which is highly significant. On comparing between the groups, it was observed that there is statistically significant difference between the two groups in terms of pain on NRS.

3 This graph shows Mean score in NRS between participants in group A and B.



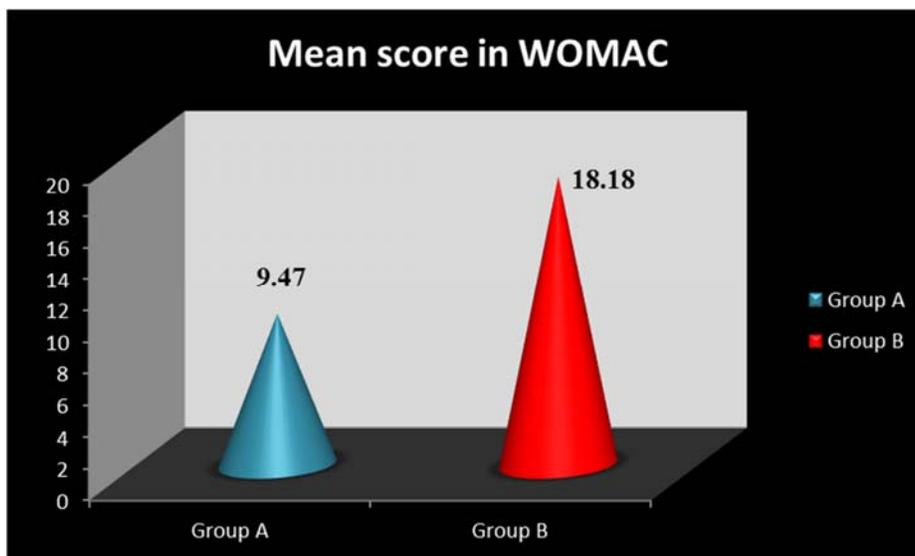
Graph 3: Above graph represents comparison of group A and group B using paired t test in which p value is 0.0176 and t value is 2.5116; which is significant.

4. This graph shows mean of physical function within the groups on WOMAC A and B



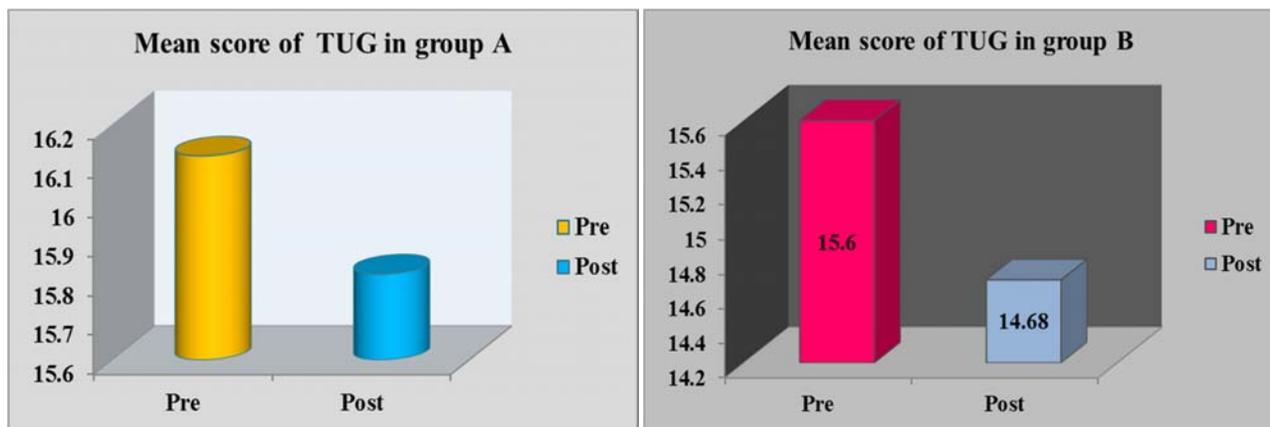
Graph 4: Above graph represents on comparing between the groups that there was statistically significant score between the two groups in functional performance on WOMAC.

5. This graph shows mean score in WOMAC between participants in group A and B.



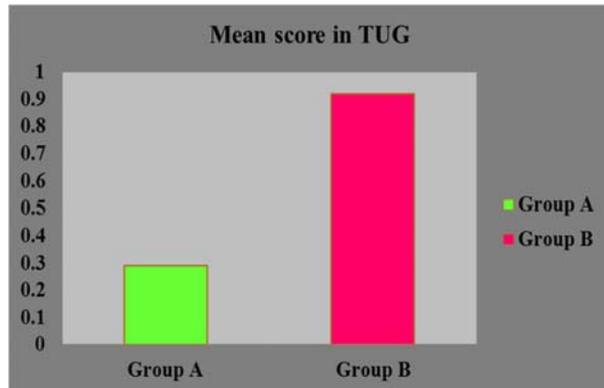
Graph 5: Above graph represents comparison of Post A and Post B using paired t test in which p value is 0.0398 and t value is 2.1498; which is significant.

6. This graph shows mean of physical mobility within the two groups A and B on TUG



Graph 6: Above graph represents on comparison of mean score in TUG of both groups of physical mobility using paired t test in which p value is 0.0331 and t value is 2.3642; which is significant

7. This graph shows mean score in TUG between participants in group A and B



Graph 7: Comparison of group A and group B using paired t test in which p value is <math><0.0331</math> and t value is 2.3642; which is significant.

Discussion: The purpose of this study was to investigate the effectiveness of conventional therapy and the kinesiotaping and conventional therapy alone in participants with OA Knee. The results of this study found that both groups showed significant improvement but the experimental group showed more improvement than the control group. So it can be stated that the additional effect in the experimental group was may be due to KT.

Knee osteoarthritis is a prevalent condition contributing significantly to functional limitation and disability. OA is due to pain, decreased muscle strength, instability and stiffness. Numerous studies revealed pain in OA knee is due to increased abnormal ground reaction force loading on joint and decreased extensor moment.

Kinesiology taping is designed to assist and improve the body's natural healing process and has a number of methods of application and benefits of use, it is proposed to: (1) improve the localized effect of fluid circulation (blood and lymph); (2) decrease pain; (3) provide anatomical support; (4) enhance muscular and joint range of motion; (5) assist proprioception. (1) Impacting localized fluid circulation: Once applied to the skin Kinesiology tape is reported to lift the upper layers of skin, creating more space Compressed blood vessel Compressed lymph vessel Skin Fascia Inflamed muscle Compressed pain receptor Dilated blood vessel Dilated lymph vessel Uncompressed pain receptor between the skin and underlying muscles. This space is believed to reduce pressure on the lymph channels and create more space for circulation, flow and improve lymph drainage through the taped area. This can help decrease swelling and pain in injured areas. It also helps improve blood flow circulation, increased blood flow to and from the muscle increases the presence of oxygen and nutrients to assist with repair of damaged tissues and accelerates the breakdown and removal of waste product when muscles are tired. (2) Decrease pain: Kinesiology tape relieves physical and neurological pain, the tapes lifting action helps to relieve pressure on the pain receptors located under the skin. (3) Provides anatomical support + (4) enhanced/normal muscular and joint range of motion. (5) Assists proprioception: Kinesiology tapes unique elastic properties ensure that muscles and joints are closely supported during all activities, discourages harmful movements whilst still allowing a safe and healthy range of motion. Different

applications of Kinesiology tape can also be used to improve joint alignment and can improve the function of a joint by influencing opposing muscle groups and joint mobility. Kinesiology tape can be worn for up to five days during intense exercise, swimming, showering and bathing as the tape is quick drying.

In this study, the participants were given strengthening exercises such as static and dynamic quadriceps exercises, straight leg raise, hip abduction exercise, prone knee bending, and hip extension exercise as the strength of the quadriceps improved and thereby joint become stronger and reduced the pain.

Conclusion: On the basis of present study, it can be concluded that conventional therapy is effective in osteoarthritis knee pain but kinesiotaping and conventional therapy more effective in decreasing the osteoarthritis knee pain. There was difference in pain, stiffness and functional ability when kinesiotaping was performed in individuals with osteoarthritis of knee. Hence this technique can be beneficial with standard conventional physiotherapy for treating patients with Osteoarthritis.

Recommendations: Further long term follow-up studies are needed to find the effect of kinesiotaping on osteoarthritis of knee with large sample size.

Acknowledgement: Indeed I am very glad to present this project as a part of my Internship. I wish to express my sincere gratitude to all those who really helped with it.

I am truly blessed by the constant support of my principal Dr. Subhash Khatri and his worldly advice and counseling at every step.

I wish to express my deep gratitude to my professor and my project guide Dr. Deepali Hande who has helped me to choose this project topic and provide me with constant guidance and support throughout the project.

I wish to thank all my professors and my senior colleagues for their cooperation, tolerance and guidance all throughout this project.

I express my special thanks to all my friends for their support throughout and all other participants for their unconditional understanding and co-operation. They are an essential part of my project.

My sincere thanks to all enthusiastic participants who volunteered and made it possible to withdraw a conclusion.

I would like to bow to THE ALMIGHTY and MY PARENTS whose blessings, love and encouragement have always been a catalyst in all walks of my life.

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