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Original Article

Effectiveness of kinesio-taping on pain and functional disability on non-specific low back pain-a randomized clinical trial.

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ABSTRACT

Introduction: Non-specific low back pain is defined as pain not attributable to a recognizable or known specific pathology. Non-specific low back pain is characterized by the absence of structural change. The most frequent site of low back pain is in the 4th and 5th lumbar segment. Chronic low back pain constitutes one of the greatest factors limiting activity in adults under the age of 45. Methods and Materials: 30 patients (15 in each group), both males and females weretaken. Informed consent were signed by the patients and patients were divided into two groups by random number table, Group A and Group B. Patients were assessed at 0 day before giving treatment and follow up of patients were done on 2nd week and 4th week after completing the treatment. Group A patients were receiving conventional physiotherapy including of moist heat therapy and spinal strengthening (lumbar loading) exercises. Treatment was given for 5 times a week for 4 weeks. Group B patients were receiving kinesio taping plus conventional physiotherapy. Kinesio tape wasapplied twice a week for 4 weeks for a total of 8 sessions. VAS (Visual Analog Scale), RMQ (Roland Morris Disability Questionnaire) and ROM (Range Of Motion) were checked. Discussion& Conclusion:There was no significant difference at 2nd week as compared to 0 week ($p>0.001$ or $p>0.05$) of VAS, RMQ, ROM (Flexion), but there was a significant difference at 4th week ($p<0.001$ or $p<0.05$) as compared to both 0 week and 2nd week. Therefore, it seems that the Kinesio-taping plus conventional physiotherapy are more beneficial than conventional physiotherapy alone when treating nonspecific low back pain patients.

1. Introduction

Low back pain is the common clinical problem. The term low back pain refers to pain in the lumbosacral area of the spine encompassing the distance from 1st lumbar vertebra to the 1st sacral vertebra. The most frequent site of low back pain is in the 4th and 5th lumbar segment (Mousa et al. 2008). According to its duration low back pain may be classified as Acute (sudden onset and lasting less than six weeks), Sub acute (lasting 6 to 12 weeks), Chronic (lasting longer than 12 weeks) (Lizier et al. 2012). Chronic low back pain constitutes one of the greatest factors limiting activity in adults under the age of 45 (Wheeler, 2009). Most of the back pain is not treated well and the patients get chronic low back pain (Yousefpour et al. 2013). It is estimated to affect approximately 40% of the adult population within a 1-month time frame (Deyo et al. 1992). Non-specific low back pain is defined as pain not attributable to a recognizable or known specific pathology (Asthana et al. 2013). The incidence of nonspecific low back pain is higher in workers subjected to heavy physical exertion, such as weight lifting, repetitive movement, and frequent static postures (Lizier et al. 2012).

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There are several treatments for low back pain, such as medications (anti-inflammatories, corticosteroids, paracetamol, dipyrone, tramadol, opioids, muscle relaxants, antidepressants, and anticonvulsants), physical measures (short waves, ultrasound, transcutaneous electrical stimulation, and laser), infiltration, blockade, and acupuncture. However, the effectiveness of the therapeutic interventions is not fully proven (Daniele et al. 2013).

A new approach for the treatment of non-specific low back pain is to support the affected area, relax the muscles and reduce pain sensation and is referred to as Kinesio-Tape. Kinesio tape, invented by KenzoKase in 1996, is a new application of adhesive taping. It elevates the epidermis increasing the pressure on the mechanoreceptors below the dermis, thus decreasing nociceptive stimuli (Added et al. 2013). This tape is also latex-free and features an adhesive that is 100% heat-activated acrylic. The tape is typically applied over and around muscles to prevent over-contraction. This technique relieves pressure and irritation that can create pain (Mostafavifor et al. 2012). It is a thin and elastic tape which can be stretched up to 120-140% of its original length that makes it quite elastic and result in less mechanical constraints, compared to conventional tape (Yousefpour et al. 2013). Kinesio-Tape was conceived to be therapeutic and according to its creators, yields the following result: - (Kase et al. 1996).

i. It corrects muscle function by strengthening weak muscles.

ii. It improves blood and lymph circulation by eliminating tissue fluid or bleeding beneath the skin through muscle movement.

iii. It corrects misaligned joints by retrieving muscle spasm.

iv. It reduces pain through neurological suppression.

Kinesio-Tape has elastic mechanical properties, similar to skin to allow normal Range of motion. And thus it does not restrict movement (Albahel et al. 2013). The 100% cotton fibers allow for evaporation and fast drying, thereby ensuring that patients can wear the tape even in the shower or pool without the need for reapplication; this allows for a wear time of 3 to 5 days and makes the treatment more economical (Mostafavifor et al. 2012).

For measuring the degree of pain VAS is used which is one of the most common and most sensitive methods of pain measurement. Validity of this system in researches has been reported to be excellent (Yousefpour et al. 2013). The Roland Morris Disability Questionnaire is used to assess disability associated with back pain (Stratford PW et al. 1996).The aim of this study is to evaluate the effectiveness of kinesio-taping on pain and functional disability in patients with non-specific low back pain.

PURPOSE OF THE STUDY

To find out the effect of kinesio taping on pain and functional disability on non-specific low back pain

MATERIALS AND METHODS:

Inclusion criteria

1. Patients of both genders were taken.
2. Age groups between 18-45 years.
3. Chronic low back pain.
4. Diagnosed with non-specific low back pain.

Exclusion criteria

1. Radicular nerve compression.
2. Osteoporosis.
3. Bone disorders in the spine.
4. Infection in the spine (Discitis or other).
5. Meningitis.

6.Arthrosis.

7.Autoimmune disorders (Rheumatic Arthrits or other).

8.Lumbar fixation surgery.

9.Cauda equine syndrome.

10.Spinal pathologies (fractures, tumors, and inflammatory pathologies such as ankylosing spondylitis).

11. Nerve root compromise (disc herniation and spondylolisthesis with neurological compromise, spinal stenosis, and others).

12. Contraindication to the use of Kinesio taping (allergy or intolerance).

13. Serious cardiorespiratory diseases.

14. Pregnancy.

PROCEDURE:

Study was approved by Research and Ethical committee of University College of Physiotherapy (UCOP), Faridkot. 30 patients were taken from OPD of University College of Physiotherapy, Faridkot referred from Department of Orthopedics, Guru Gobind Singh Medical College and Hospital, Faridkot based on inclusion and exclusion criteria. Informed consent was signed by each participant. After the assessment patients were divided into two groups: Group A and Group B based on randomization. Randomization was done by using random number table, with allocation concealment by opaque sequentially numbered sealed envelopes.Patients were assessed at 0 day before giving treatment and follow up of patients were done at the end of 2nd week and 4th week after completing the treatment.

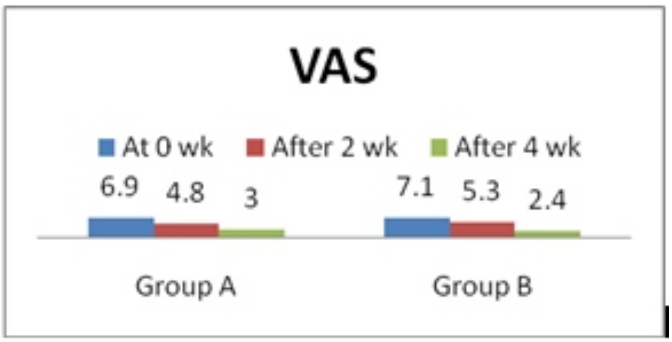
Group A: Patients in Group A received conventional physiotherapy consisting of moist heat therapy and spinal strengthening (lumbar loading) exercises(Al-Obaidi et al. 2001). The patients were given moist heat therapy for 10 minutes. After heating, patients performed four sets of 10 repetitions of lumbar flexion and extension (in standing and in lying positions) with 30-60 seconds rest between sets (Donelson et al. 1991). Treatment was given for 5 times a week for 4 weeks. One each moment, the patient reaches the maximum possible end range of his or her lumbar spine in the direction of the movement and maintains the position for 1 to 2 seconds before the next repetitions and patients were asked not to hold their breath during exercises. These exercises were performed in continuous rhythm. Patients became familiar with the exercises by verbal instruction, demonstration and practice, before being instructed to perform the exercises.

Group B: Patients allocated to this group received the same treatment as the Group A (moist heat therapy and spinal strengthening exercises) and at the end of session, kinesio taping was applied to the lumbar spine. The area to be treated was cleaned and free of hair. The twoI-Tapes were applied from the origin of the lumbar erector spinae (iliocostalislumborum) to its insertion (Albahelet al. 2013). The kinesio tape were positioned on the paravertebral muscles (bilaterally) parallel to the spinous processes of the lumbar spine, starting near the posterior superior iliac spine at the level of the T12. Firstly, the initial anchor point was applied to the sacral region (at the S1) without tension (0%). After that, the patient were asked to flex the trunk and the kinesio tape were applied in the shape of an "I" over the skin in the paravertebral region up to the extremity of the T12 vertebra at 10-15% tension, and finally the final anchor point were fixed directly above the T12 with 0% tension (Marco et al. 2013). The tape was rubbed by hand several timesto warm the adhesive film to achieve adhesion (Albahelet al. 2013). Kinesio tape wasapplied twice a week for 4 weeks for a total of 8 sessions.

DATA ANALYSIS: The data were summarized as Mean$\pm$SD. In between Groups, analysis was done by independent t-test. A $p<0.05$ was considered statistically significant. All analyses were performed on SPSS (Version 20) software.

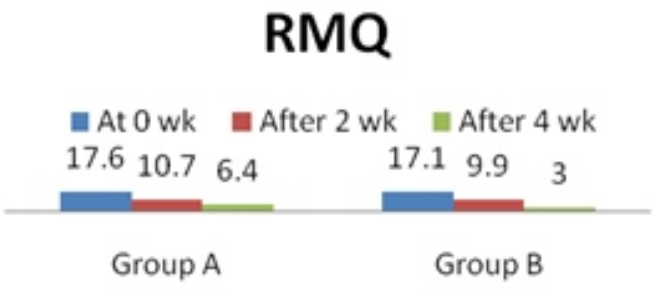
RESULTS:

Visual Analog Scale (VAS): Graph 1. Showing comparison at 0 week, after 2nd week and 4th week scores of VAS of Group A and Group B.



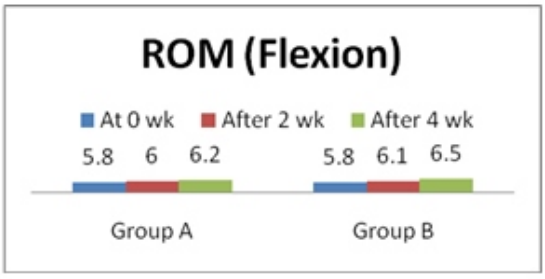
Comparing the mean VAS levels of Group A and Group B, the VAS levels in Group A decreased significantly ($p<0.01$ or $p<0.05$) at both 2ndweek and 4th week. However, at 4th week it decreased (improved) significantly ($p<0.001$ or $p<0.05$) as compared to both at 0 week and 2nd week. In contrast, in Group B, it decreased significantly ($p<0.001$) at both 2ndweek and 4th week as compared to 0 week.

Roland Morris Questionnaire (RMQ): Graph 2. Showing comparison at 0 week, after 2nd week and 4th week scores of RMQ of Group A and Group B.

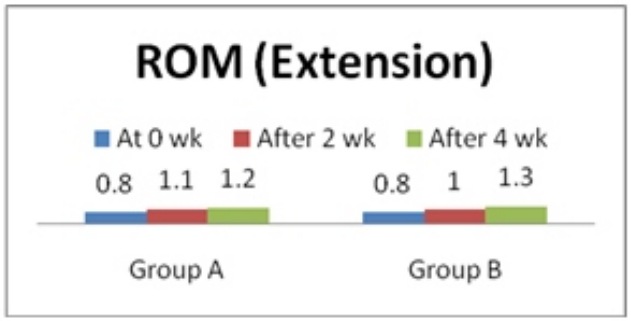


Comparing the mean RMQ levels of Group A and Group B, the RMQ levels in Group A decreased significantly ($p<0.001$or $p<0.05$) at both 2ndweek and 4th week. However, at 4thweek it decreased (improved) significantly ($p<0.001$ or $p<0.05$) as compared to both at 0 week and 2nd wk. In contrast, in Group B, it decreased significantly ($p<0.001$) at both 2ndweek and 4th week as compared to 0 week.

Range of Motion (Flexion): Graph 3. Showing comparison at 0 week, after 2nd week and 4th week scores of ROM (Flexion) of Group A and Group B.



ROM (Extension): Graph 4. Showing comparison at 0 week, after 2nd week and 4th week scores of ROM (Extension) of Group A and Group B.



DISCUSSION

This study concluded that kinesio-taping with or without conventional physiotherapy was effective in reducing pain and improving functional abilities. However, it was concluded that kinesio-taping plus conventional physiotherapy is better than alone conventional physiotherapy. Patients who had received kinesio-taping plus conventional physiotherapy showed decrease in pain and improving functional abilities as compared to those who received conventional physiotherapy alone.

Asthana et al. 2013 studied the effectiveness of kinesio-taping in improving pain, lumbar extension range of motion and disability in patients with chronic low back pain. The improvement seen in VAS, lumbar extension ROM and RMQ in Kinesio-taping group than conventional group. This study is relevant with the present study for the use of kinesio-taping in non-specific low back pain patients.

Added et al. 2013 studied on efficacy of adding the kinesio-taping method to guideline endorsed conventional physiotherapy in patients with chronic non-specific low back pain. The results showed an improvement seen in VAS and ROM in patients with non-specific low back pain. This study is relevant with the present study for the use of kinesio-taping in non-specific low back pain patients.

Castro-Sanchez et al. 2012 studied that does kinesio-taping reduce disability, pain, kinesiophobia in people with chronic non-specific low back pain? And it was concluded that the kinesio-taping reduced disability and pain in people with chronic non-specific low back pain. This study is relevant with the present study for the use of kinesio-taping in non-specific low back pain patients.

Kachanathu et al. 2014 studied the comparison between kinesio-taping and a traditional physical program in treatment of non-specific low back pain. It was concluded that a physical therapy program involving strengthening exercises for abdominal muscles stretching exercises for back, hamstring and iliopsoas muscle with or without taping was beneficial in the treatment of chronic low back pain. This study is not relevant with the present study for the use of kinesio-taping in non-specific low back pain patients.

LIMITATION OF THE STUDY:

The sample size for the study was small.The time period of follow up was short.

CONCLUSION:

The present study has concluded that both conventional physiotherapy alone and kinesio-taping plus conventional physiotherapy are effective in reducing pain and disability and

Conclusion

From the results of the current study, we can conclude that fractures in animals with inflicted brain or spinal cord injury heal more expectedly, rapidly, and with formation of exuberant abundant callus which progress early into remodeling, suggesting a central neuronal control and a neural or combined neuro- hormonal or neuro-humoral mechanism to explain this accelerated osteogenesis. We can also, conclude that serum from animals with traumatic central nervous tissue damage has no osteogenic effect in vivo. To confirm this basically neural theory, a further experimental work on animals is needed, especially, to disclose the effect of sympatholytic drugs on fracture healing.

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