



Effects of Kinesio-Taping in Lateral Epicondylitis: A Narrative Review

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Aim: The objective of this narrative review was to assess the effects of Kinesio-Taping in Lateral Epicondylitis.

Methods: A comprehensive search of already published relevant articles only from medical databases like Google Scholar, PubMed and ScienceDirect was carried out for obtaining the same from the year 2014-2019.

Background: Lateral epicondylitis is a familiar musculoskeletal disorder that primarily affects the extensors of the wrist. Kinesio-taping (KT) is a newer generation taping technique that aid's the body's healing process whilst supporting and giving stability to the muscles and joints without hindering the range of motion of the body.

Conclusion: The current review recognises the need for Kinesio-Taping in individuals with Lateral Epicondylitis as it has shown to enhance the functionality of the wrists and reduce pain.

Limitations: More in-depth studies are to be conducted to find out the mechanism behind Kinesio-Taping.

Keywords: *Lateral epicondylitis; pain reduction; Kinesio-Taping; proprioceptive stimulation; hand grip strength.*

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1. INTRODUCTION

Lateral Epicondylitis commonly known as Tennis Elbow or Lateral Elbow Tendinopathy is an agonising elbow condition that is caused by excessive use of wrist extensors [1]. This can be a work-related repetitive strain/ sports specific injury [2, 3]. Hence, individuals operating any hand tools (like a hammer, screwdriver or pliers) and doing other activities involving wrist-twisting, pulling, bending, and gripping can lead to Lateral Epicondylitis [4]. With an incidence rate of 15.1 per 10000 patients (in the United States of America alone), lateral epicondylitis affects men and women equitably anywhere between 30 to 60 years of age, peaking in the early 5th decade [5,6]. It has been accounted for that Lateral Epicondylitis is the 2nd most repeatedly detected musculoskeletal disorder among the public [7].

A wide-spread of approaches are available in the treatment of Lateral Epicondylitis that include resting, icing, bracing, prophylactic counseling, exercise therapy, manual therapy, Non-steroidal anti-inflammatory drugs, local injections using corticosteroids, Laser and finally surgery. That being said, treatment mediations for Lateral Epicondylitis still need logical approval [8].

The quest for new helpful methodologies fit for forestalling and managing musculoskeletal disorders is expanding exponentially in relation to current mechanical advancements. In this backdrop, taping strategies have been created as a supplement to the treatment of these disorders, and has worked on after some time to give remedial effects that do not obstruct the function of a specific body segment [9].

Mc Connell suggested that taping aids in decreasing pain, influences range of motion in the joints, reducing the impacts of inflammation, unloading pain created in the tissues and protects and supports during the movement. This taping technique exhibits generous enhancements in pain free grip-strengths and pressure pain thresholds in past investigations [10].

A renowned chiropractor named Dr. Kenzo Kase, invented Kinesio-taping (KT) in 1976 that mimics the elastic properties of the human skin. The KT mechanism sprung from the speculation that an external unit can assist in the functions of muscles and other tissues. By design, the tape is elastic and thin, stretching up to 40% - 60% of the actual length, making it extremely pliable

compared to its ancestors. The tension created in the skin improves the transmission with mechanoreceptors when stretched and increases the motor unit recruitment amid a muscle contraction. Muscle function is improved by this process and facilitates the contraction of inactive muscles. The employment of KT over the wrist extensors can be another approach for patients with Lateral Epicondylitis [9].

Despite a variety of treatment choices accessible, the evidence to choose the best one for Lateral Epicondylitis is still deficient. The goal of this narrative review is to discuss the effects of Kinesio-Taping in the treatment of Lateral Epicondylitis.

1.1 Pathogenesis

An established pathology has not yet been identified but is repeatedly linked with any work-related activities involving repeated movements/ straining of the wrist. Movements such as excessive gripping, wrist extension, and forearm supination lead to microtrauma of extensor tendons (particularly the Extensor carpi radialis brevis). Over time it leads to hyperplasia of wrist extensor tendons, ultimately leading to tendon degeneration and resulting in Lateral Epicondylitis [6,11,12,13].

1.2 Clinical Presentation

The patient will usually present with pain and tenderness at the lateral epicondyle, decreased grip strength, and inability to extend the wrist. It can aggravate along the upper forearm and cascading through the outer part of the forearm. The pain can also be aggravated with resisted dorsiflexion and radial deviation of the wrist and also wrist extension and fingers extension with elbow extension [8,14].

1.3 Diagnosis

During physical examination, special tests like Cozen's (sensitivity = 91%, specificity = 80%) and Mill's (sensitivity = 76%, specificity = 85%) tests are used to determine if the patient has lateral epicondylitis [15,16,17,18]. Other imaging diagnosis like X-Ray shows calcification around the lateral epicondyle with MRI and Ultrasound presenting with fluid (hypoechoic) in the extensor carpi radialis brevis tendon origin plus degenerative changes [19,20].

1.4 Kinesio-Taping

KT is generally placed over and around the region to block off further contraction of the muscles. It is hypothesised to decrease pain and inflammation through the improvement of lymphatic and hematological systems without the restriction of the affected part's range of motion. This method lessens pressure and pain that is caused by irritation of the neurosensory receptors by lifting the skin minutely [21].

The function is refined by allowing muscle support without hindering any movement. This is attained by stimulating a sudden rise in muscle strength through a concentric pull on the fascia which may then trigger a muscle contraction or improves the muscle alignment that is instrumental in muscle strength increment. The pain is reduced within the first 24 hours and hopefully for up to a week [21].

This endorses the context that KT can be employed for patients having lateral epicondylitis.

2. DISCUSSION

The review will discuss about the effects of Kinesio-Taping in Lateral Epicondylitis where PubMed, Google Scholar and ScienceDirect were used as databases from the year 2013 – 2019 using the following keywords: “Lateral epicondylitis”, “Kinesiotaping”, “Kinesiotaping in lateral epicondylitis” and “effects of kinesio taping in lateral epicondylitis”, for obtaining relevant articles. As there is a dearth of meticulous research on this topic and to include only the most recent studies, 9 articles were chosen based on the selection criteria:

Inclusion criteria:

- Studies conducted on human population.
- Studies that included Kinesio-Taping as the main intervention.
- Studies that included participants with lateral epicondylitis only.

Exclusion criteria:

- Non-English articles in full-text format.
- Non-reputed journals.

2.1 Kinesio-Taping in Pain Reduction

Zaky conducted a study using KT with the diamond technique that aimed at producing pain relief. The results showed improvements in the

pain parameter which he proposed that the tape decreases the stress generated by the muscle contractions in turn decreasing pain. The assumption is in relation to the neurophysiological effects, specifically the nociceptive system where the signaling pathway is blocked by inhibition of nociceptors and stimulating an inhibitory pain mechanism [22].

The second assumption is aimed at reduction of pain through improved blood circulation that was analyzed by Giray et al., where they noted that this theory was important in choosing a placebo taping and also found that KT plus exercises were superior in reducing pain and disability. They also proposed that eccentric training increased tendon strength by stimulation of mechanoreceptors to produce collagen fibers [15].

KT exhibited a notable recovery in pain whilst performing wrist extension with resistance and also improved pain-free grip strength which was conducted by Cho YT et al., in individuals with chronic lateral epicondylitis. The results obtained endorsed it for a short-term pain management strategy with its mechanism still unclear and their mechanism is associated with the study of Zaky who also pointed out to the gate control theory as the non-neuronal cells that act as the signaling pathway is blocked via the stretch of the tape through keratinocytes by stimulating an inhibitory pain process [23].

2.2 Kinesio-Taping in Enhancing Grip Strength

Gracias A et al., performed a study to differentiate the effects of pain pressure threshold and grip strength where KT was effectual in increasing grip strength and decreasing pain in people with lateral epicondylitis. This leads to another assumption that the muscle technique assisted in reducing muscle tension bettering the grip strength and diminishing pain only after subsequent application of KT [16].

Rashi Goel et al., conducted a study that compared the effects between athletic tape (AT) and KT. The results were positive and showed an increment in pain free grip strength of 23%. Their study matched another study of Bill Vincenzino in 2003 that measured the hand-grip strength in elbow flexion of 90° by the recommendation of the American Society of Hand. This increment is attributed to the

inhibition technique put on the wrist extensor resulting in better functioning [10].

This is also backed by Shaheen H et al., a study that compared the effects between ultrasound and KT in which KT was better in improving the hand grip strength only for a short term effect [24].

These three studies exemplified the usage of KT.

2.3 Kinesio-Taping in Improving the Functionality/ Disability of the Wrist

A study done by Sari et al., aimed at comparing the efficacy of TENS (Transcutaneous Electrical Nerve Stimulation) and KT in the treatment of LE where they concluded that both the interventions combined had better effects on pain and functionality of the wrist after a 12 week intervention. But, these effects could not sustain till week 12 which could be because of the self-limiting nature of the condition and recommended for further studies [25].

Eraslan L et al., conducted a study to show if KT improves functionality and pain in lateral epicondylitis patients where KT was utilized from insertion to origin of the extensor carpi radialis brevis and the base of fascia correction was put at the point of pain. This provided sensorimotor

and proprioceptive feedback mechanisms which are presumed to boost the lymphatic drainage. The rise in the number of the muscle fibers was seen to improve the functionality of the wrist through the proprioceptive stimulus which formulated another theory for KT [26].

Bhambani S et al., whose study upheld this theory of improved functionality of the wrist as here KT supported the muscles around the elbow during movement that decreased tension around the area, pain and gave a proprioceptive feedback to the patient [27].

This current narrative review deduced that Kinesio-Taping can be employed in the treatment of Lateral epicondylitis as it helps in the reduction of pain, improving the grip strength and the overall function of the wrist. The potential clinical implication can be that KT can facilitate the wrist for Lateral Epicondylitis.

The selected articles were then subjected to the PEDro (Physiotherapy Evidence Database) scale for quality assertion of articles with total scores ranging from 0 – 11 [28]. A mean score of 7 for the 9 articles utilized further indicate that KT can be implemented for patients with lateral epicondylitis [Table 1.].

Table 1. Summary of utilised articles

Study	Subjects	Groups	Results	PEDro Scale
Esra Giray et al. (2019) [15]	31 patients were selected and randomized into 3 groups	Group 1 – KT plus exercises, Group 2 – sham taping plus exercises, Group 3- only exercises	KT showed better pain reduction and functionality than sham taping.	10 ~ Excellent
Alicia Gracias and S Shobhalakshmi (2019) [16]	30 individuals were selected and randomized into 2 groups	Control group and experimental group	Improved grip strength and pain reduction.	7~ Good
Sonam Bhambhani et al. (2019) [27]	24 participants were randomly assigned to 2 groups	Group A – KT with conventional physiotherapy, Group B – conventional physiotherapy only	Group A yielded better results in terms of improved functionality and pain reduction.	6 ~ Good
Hamza Shaheen et al. (2019) [24]	20 patients aged between 20 – 50 years were randomly selected and divided into 2 groups	Group A – ultrasound and exercises, Group B – KT and exercises for 12 sessions over a 4 week period; 3 sessions/ week.	Group B showed significant improvement in hand grip strength and is better than ultrasound.	7 ~ Good

Study	Subjects	Groups	Results	PEDro Scale
Yeng-Tin Cho et al. (2018) [23]	15 participants selected and randomized into 2 groups	Control group and Sham group	Reduction in pain and improved pain-free grip strength.	7~ Good
Leyla Eraslan et al. (2017) [26]	45 patients randomized into 3 groups	Group 1 – icing, TENS & home exercise program, Group 2 – KT with physiotherapy 3 – Extracorporeal shockwave therapy with physiotherapy	Improved pain-free grip strength and wrist functionality.	7~ Good
Rashi Goel et al. (2015) [10]	16 patients were randomly divided into 2 groups.	Group A – AT, Group B – KT	Both AT and KT showed improved muscle strength.	6 ~ Good
G. Sari et al. (2014) [25]	78 patients who volunteered were randomized into 4 groups	Group 1 – TENS + KT, Group 2 – TENS + Sham KT, Group 3 – Sham TENS + KT, Group 4 – Sham Tens + Sham KT	KT and TENS combined showed better improvements in pain and functionality.	10 ~ Excellent
Lilian Zaky (2013) [22]	30 patients were randomly divided into 2 groups	Group A – Diamond KT + Ultrasound, Group B – Ultrasound only	Group A showed better gains in muscle strength and pain.	6 ~ Good

3. CONCLUSION

Based on this narrative review and with a mean PEDro score of 7, KT has been shown to reduce the pain intensity, improve the pain pressure threshold and the hand-grip strength, overall refining the functionality of the wrist extensors. This review implies that KT can be adopted in the effective management of Lateral Epicondylitis as a short-term intervention.

4. LIMITATIONS

In spite of the encouraging results, more randomized control trials are to be conducted to pinpoint the mechanism behind Kinesio-Taping with a larger sample size.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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