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The efficacy of kinesio taping versus forearm-band therapy in treating lateral epicondylitis: A prospective, single-blind, randomized, controlled clinical trial

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Abstract

Background/Aim: The treatment of lateral epicondylitis (LE) is generally conservative, but evidence for its effects is insufficient. Although Kinesio Tape (KT) and forearm bandages (FB) are applied in the treatment of LE, the results regarding the effectiveness of these two treatment methods are controversial. Moreover, to our knowledge, no study compared these two methods with each other. Our aim was to investigate the effects of Kinesio Tape (KT) and forearm bandages (FB) on pain, tenderness, grip strength, function and quality of life and to compare these two methods.

Methods: This study included 62 patients with LE diagnosis, between ages of 20 and 65. Patients were randomly assigned to one of two groups, representing KT (Group 1 = 31) and FB (Group 2 = 31), respectively. LE exercises were assigned as home programmes to both groups. Pain (VAS), the pressure pain thresholds (PPT), handgrip strength (HGS), the patient-rated tennis elbow evaluation (PRTEE), and the 'Short Form-12' evaluation parameters were used. Patients were evaluated at the beginning, third and sixth weeks.

Results: Significant difference was not observed between two groups in terms of demographic data and baseline evaluation parameters ($P>0.05$). In group 1, a significant improvement was observed across all evaluation parameters at both the third and sixth weeks, except the PPT at the sixth week ($P<0.05$). Meanwhile, in group 2, a significant improvement was observed across all evaluation parameters except the PPT at the third week and the SF-12 mental component at the third and sixth weeks ($P<0.05$). No significant difference in evaluation-parameter scores was observed between the two groups at the third and sixth weeks ($P>0.05$)

Conclusion: The KT and FB treatments significantly improve LE patients' pain, handgrip strength, functions and quality of life. Moreover, neither method is superior to the other in this regard.

Keywords: Forearm band, Kinesio tape, Lateral epicondylitis, Tennis elbow, Treatment

Introduction

Lateral epicondylitis (LE) is the most common cause of elbow pain, and called as *tennis elbow* [1]. LE's prevalence is reported at 3% among the general population, and this rate is expected to increase among factory workers and paddle athletes [2-4]. LE commonly affects the middle age (40-54 years) population, and affects women and men in equal proportion. The dominant upper limb is more frequently affected [5]. Difficult or repetitive movements of the wrist or forearm and firm hand grips at a $\geq 45°$ forearm pronation have been reported as risk factors for LE [6]. The condition clinically presents as pain around the lateral epicondyle, which manifests in a strong wrist extension. Degenerative angiofibroblastic hyperplasia of the wrist extensor tendons due to recurrent microtraumas is considered to be responsible for LE etiopathogenesis [7]. Patients with LE have also been reported to exhibit sensorial system alterations and neuromuscular insufficiency [8, 9]. Although LE treatment is generally conservative (e.g., oral drugs, steroid injections, physiotherapy and orthosis), insufficient evidence has been found for the effects of many treatments [10, 11].

Kinesio Taping (KT) has been widely used to manage various musculoskeletal problems. Invented by the Japanese chiropractor Kenzo Kase in the 1970s, the tape is composed of a heat-sensitive acrylic adhesive and an elastic woven cotton with a maximum usable tension of about 40–60% of its overall length. KT is assumed to have many physiological effects, including pain relief, normalized muscle functions, improved proprioceptive feedback, corrected joint incompatibility, and increased subcutaneous blood and lymphatic circulation [12]. There is no consensus regarding the optimal tape type and its application technique [13]. Moreover, the evidence regarding KT's both immediate and short-term follow-up effects is contradictory, and few studies have investigated its effects as a short-term therapy [5]. Dilek et al. [12] reported that, patients with LE experienced decreased pain and significantly increased grip strength after applying KT. In a placebo-controlled study, KT seemed to have additional effects in controlling the pain associated with elbow wrist extensions while tactual pain relief and painless grip strength had equivalent effect to a placebo [7].

Forearm bandages (FB) are a commonly used orthosis to treat LE. They are worn under the elbow. FB's main purpose is to target the cause of a lesion by reducing overload on the wrist extensors' common origin [14, 15]. Studies have shown that the use of orthoses provides immediate relief and is more effective for patients' daily activities than other methods, such as steroids, ultrasound, laser, massage, and exercise therapy [16]. In some studies of patients with LE, FB's effect on handgrip strength and pain was not observed, meanwhile, some studies' results showed that FB increases handgrip strength and reduces pain [17, 18].

Extensive literature has offered many controversial positive and negative findings regarding the effectiveness of these two treatment approaches (KT and FB). However, we did not find sufficient data comparing the effectiveness of these approaches. Therefore, the current study is aimed to investigate the effects of kinesiological banding versus orthosis applications (ACL) on pain, sensitivity, handgrip strength, functions, and quality of life in treating LE.

Materials and methods

This single-blind, randomized and controlled clinical study was conducted at the University of Health Sciences, Bursa Yüksek İhtisas Training and Research Hospital, Physical Medicine and Rehabilitation outpatient clinic. The study was planned in accordance with the rules of the Declaration of Helsinki, and local ethics committee approval was received (2011-KAEK-25 2019/10-12). All participants were informed about the study, and their written consent was obtained.

Sixty-two patients were included in this study. All participants included in the study had been diagnosed with chronic LE, were 20–65 years old, had pain of the lateral epicondyle for at least three months, sensitivity of the lateral epicondyle during their examinations and pain triggered by a resistant extension of the wrist. Patients with cervical radiculopathy, peripheral neuropathy, pregnancy, elbow arthritis, acute trauma to the elbow, skin lesions on the forearm, allergies, a history of surgical intervention in the upper extremities, inflammatory, autoimmune, endocrine or renal diseases, previous KT and FB treatment, previous physiotherapy, or steroid injections in the last three months for LE were excluded from the study.

Patients' demographic data were recorded. Additionally, patients were asked whether they had a job or hobby that required repetitive arm movements or upper limb strength. According to their responses, occupational disease was recorded as either *present* or *absent*. Patients were randomly assigned to one of two groups via a computer, using a random number table (http://www.random.org/). Patients in the first group received KT treatment (Group 1 = 31), and patients in the second group received FB treatment (Group 2 = 31). KT was applied by a certified researcher from the forearm extensor muscles' origin to their insertion, using a muscle technique for a longitudinal KT strip, additionally, a transverse elbow band was applied using the 'fascial correction' technique (twice per week for three weeks; Figure 1).

Figure 1: KT application was applied from the origin of the forearm extensor muscles to the insertion using a muscle technique as a longitudinal kinesiotape strip and additionally a transverse elbow band was applied using the 'facial correction' technique.

The FB used in this study was a brace made of neoprene with triangular padding that was approximately 5 cm wide. This FB was placed on the extensor muscle mass, distally to the lateral epicondyle. FB patients were informed of their treatment according to a standard protocol about the use and application of

FB, and they were instructed to wear their FB continuously for three weeks. In the event of any discomfort, they were told to remove their bandages for no longer than an hour. Moreover, they were allowed to continue their daily activities to the extent FB enabled. LE exercises – including stretching and strengthening exercises – were assigned as a home programme to both groups (three sets and 10 repetitions). Patients were instructed to continue these exercises even if they experienced mild pain. However, they were instructed to stop these exercises if their pain became disabling.

All patients were warned to avoid rigorous activities, NSAIDs and analgesics. Patients were evaluated by the same investigator, who was kept uninformed of patients' respective therapies before treatment, at the end of their three-week treatment (at the third week after the beginning of their treatment) and at the end of the following three-week, treatment-free period (at the sixth week after the beginning of their treatment).

Evaluation parameters

Pain: Pain was assessed with a visual analogue scale (VAS) during four different activities (resting VAS, night VAS, handgrip VAS and VAS during daily-life activities).

Pain pressure threshold (PPT): Patients' PPT was evaluated with a pressure algometer (Baseline® Dolorimeters, New York, USA, 2015). Measurements were obtained from the lateral epicondyle by the same investigator under the same test conditions, at the same room temperature and test equipment. For evaluations, a 1 cm^2 circular probe connected to a pressure device was calibrated to Newton/cm^2 and used as the power unit. The pressure was increased at a rate of 1 N/sec until subjects detected pain. The test was stopped upon subjects' 'stop' command, and the onscreen values were recorded. Each measurement was conducted three times, and the average of each patient's three measurements was recorded as their PPT.

Hand grip strength (HGS): A standard hand dynamometer (Jamar® Plus + Digital Hand Dynamometer from Patterson Medical by Sammons Preston, Bolingbrook, USA) was used to measure grip strength. The reliability and validity of the Jamar dynamometer are high; therefore, the device has been considered the gold standard in assessing grip strength [19]. Hand grip strength was evaluated while patients were seated in a chair. Their shoulders were adducted and neutrally rotated. Patients' elbows were flexed to 90°, and their forearms and wrists were in a neutral position. Grip strength tests were performed three times with one-minute intervals, and the mean of these three measurements was calculated. Patients' grip strength was measured in kilogram force.

Patient-rated tennis elbow evaluation (PRTEE): A questionnaire comprising 15 questions to measure pain severity and disability levels, including pain and subdivision, was used for this study's PRTEE. The pain component consisted of five questions: pain while at rest, pain during repetitive arm movements, pain when carrying a shopping bag, and the lowest and highest amounts of pain. Meanwhile, the function component comprised six questions about specific activities and four questions about daily activities. Each response was scored on a scale of 0–10 (0 = no pain/no strain, 10 = the most pain felt/no action). Total scores were calculated out of 100. The higher the score, the greater a respondent's disability. The questionnaire's validity and reliability in Turkish had been confirmed previously by Altan et al. [20].

Short Form-12: The 12-item 'Short Form (SF-12)' was obtained by shortening the 'SF-36 Health Research' form. It comprised 12 questions that aimed to measure respondents' state of health and well-being from a patient perspective. The SF-12 determined a physical component score (PCS) and mental component score (MCS) for patients [21].

Statistical analysis

The Power Analysis: A G*Power 3.0.10 statistical power analysis programme was used for this study's power analysis. The study power (1-β) was found to be 0.79 with a post hoc analysis of $n1$ = 29, n2 = 31, α = 0.05 and effect size d = 0.98

IBM SPSS 23.0 statistical software was used to analyze this study's data. Continuous variables were expressed as mean (standard deviation) if the data conformed to a normal distribution and 'median (minimum-maximum)' if the data did not conform to normal distribution. A chi-square (χ^2) test was used to compare categorical data. The data's suitability for normal distribution was evaluated with a Shapiro-Wilk test. In cases where the data showed a normal distribution, Student's t-test was used. In cases where the data did not show a normal distribution, a Wilcoxon signed-rank test was used for intra-group comparisons, and a Mann-Whitney U test was used to compare between groups. Values of $P \leq 0.05$ were considered significant, confirming that 'there is a difference between the groups'.

Results

Two patients from group 1 did not respond to our follow-up attempts. Therefore, this study was completed with 60 patients (Group 1: n=29; Group 2: n=31) (Figure 2). No statistically significant difference was observed between two groups in terms of demographic data and baseline evaluation parameters ($P>0.05$; Table 1).

In group 1, a statistically significant improvement was observed across all evaluation parameters at both the third and sixth weeks, except PPT at the sixth week ($P<0.05$) (Table 2). In group 2, a significant improvement was observed across all evaluation parameters, except PPT at the third week and the SF-12 mental component at the third and sixth weeks ($P<0.05$; Table 2).

A comparison of the groups' difference scores revealed no significant difference in evaluation parameters between the two groups at the third and sixth weeks ($P>0.05$; Table 3). During treatment, side effects were not observed in either group.
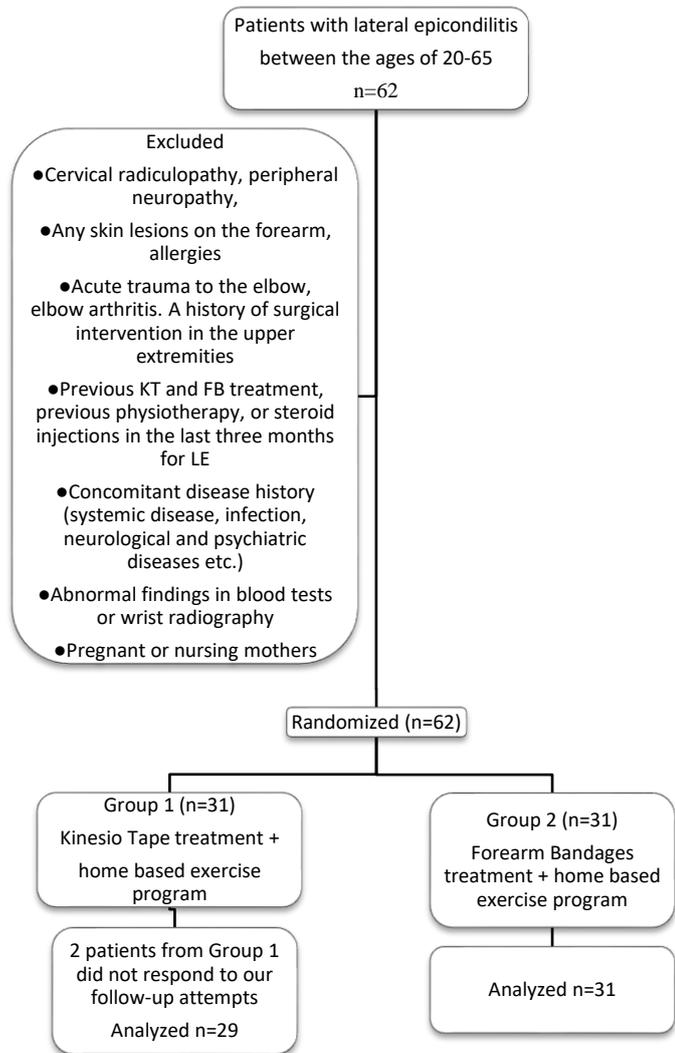
Figure 2: Flow diagram of the study

Table 1: Comparison of the demographic characteristics of the patients and pre-treatment evaluation parameters

		Group 1 (n=29)	Group 2 (n=31)	P-value
Age (year)		43.31 (9.06)	43.94 (9.28)	0.473
BMI Kg/cm^2		26.20 (21.6-38.6)	26.90 (21.8-41.4)	0.610
Gender	Female n (%)	19 (65.5%)	18 (58.1%)	0.556
	Male n (%)	10 (35.5%)	13 (41.9%)	
Occupational disease	Yes n (%)	16 (55.2%)	19 (61.3%)	0.634
	No n (%)	13 (44.8%)	12 (38.7%)	
Dominant side	Right n (%)	25 (86.2%)	30 (96.8%)	0.142
	Left n (%)	4 (13.8%)	1 (3.2%)	
Affected side	Right n (%)	13 (44.8%)	20 (64.5%)	0.129
	Left n (%)	16 (55.2%)	11 (35.5%)	
Duration of symptoms (month)		3 (3-12)	4 (3-12)	0.737
Resting VAS		4 (0-10)	3 (0-8)	0.290
Night VAS		3 (0-10)	2 (0-10)	0.378
Hand grip VAS		8 (5-10)	8 (5-10)	0.396
ADL VAS		8 (5-10)	8 (5-10)	0.507
PPT Newton/cm^2		8.5 (5.5-14)	9 (5.5-13)	0.824
Hand Grip Strength		25.46 (6.36)	28.17 (4.86)	0.072
PRTEE Pain		23 (15-41)	23 (16-45)	0.689
PRTEE function		30 (9.5-42)	25.50 (17-40)	0.200
PRTEE total		57 (24.50-81)	47.5 (36-85)	0.239
Sf 12 Physical		36.42 (4.85)	35.52 (5.72)	0.511
Sf 12 Mental		45.57 (6.76)	48.00 (7.90)	0.205

Mean (SD), Median (minimum-maximum), ADL: Activities of daily life, PPT: Pain pressure threshold, PRTEE: Patient rated tennis elbow evaluation, Sf 12: Short Form-12, P<0.05: Significant

Table 2: Intra-group comparison of 3rd week (post-treatment) and 6th week values

		3rd week (post-treatment)	6th week	P-value (0-3rd week)	P-value (0-6th week)
Resting VAS	Group1 (n=29)	0 (0-9)	0 (0-8)	<0.001	<0.001
	Group2 (n=31)	0 (0-5)	0 (0-5)	0.001	<0.001
Night VAS	Group1 (n=29)	0 (0-9)	0 (0-9)	<0.001	<0.001
	Group2 (n=31)	0 (0-5)	0 (0-4)	0.002	0.001
Hand grip VAS	Group1 (n=29)	4 (0-10)	4 (0-10)	<0.001	<0.001
	Group2 (n=31)	4 (0-10)	3 (0-9)	<0.001	<0.001
ADL VAS	Group1 (n=29)	4 (0-10)	4 (0-10)	<0.001	<0.001
	Group2 (n=31)	3 (0-10)	3 (0-10)	<0.001	<0.001
PPT Newton/cm2	Group1 (n=29)	9 (6-15)	8.5 (5-15)	0.024	0.087
	Group2 (n=31)	9 (6-14)	9 (7-14)	0.121	0.015
Hand Grip Strength	Group1 (n=29)	28.26 (6.73)	30.82 (7.39)	<0.001	<0.001
	Group2 (n=31)	30.79 (4.64)	32.49 (4.78)	<0.001	<0.001
PRTEE Pain	Group1 (n=29)	13 (0-34)	13 (0-30)	<0.001	<0.001
	Group2 (n=31)	12 (0-36)	12 (0-39)	<0.001	<0.001
PRTEE Function	Group1 (n=29)	15.50 (0-22.50)	14 (0-22)	<0.001	<0.001
	Group2 (n=31)	15 (4.50-23)	14 (0-23)	<0.001	<0.001
PRTEE Total	Group1 (n=29)	28.5 (0-54)	27 (0-54)	<0.001	<0.001
	Group2 (n=31)	27 (4.50-56)	27 (0-59.50)	<0.001	<0.001
Sf 12 Physical	Group1 (n=29)	42.17 (6.61)	42.32(6.24)	<0.001	<0.001
	Group2 (n=31)	42.93 (7.79)	43.44 (8.09)	<0.001	<0.001
Sf 12 Mental	Group1 (n=29)	47.90 (5.23)	46.74 (5.04)	0.006	0.017
	Group2 (n=31)	49.48 (5.24)	48.36 (7.70)	0.138	0.775

Mean (SD), Median (minimum-maximum), ADL: Activities of daily life, PPT: Pain pressure threshold, PRTEE: Patient rated tennis elbow evaluation, Sf 12: Short Form-12, P<0.05: Significant

Table 3: Comparison of the difference scores between the groups

	0-3rd week			0-6th week		
	Group 1	Group 2	P-value	Group1	Group 2	P-value
Resting VAS	-3 (-6-0)	0 (-6-0)	0.202	-3 (-6-0)	-1 (-6-2)	0.187
Night VAS	-2 (-10-0)	0 (-10-3)	0.266	-3 (-10-0)	-1 (-10-3)	0.378
Hand grip VAS	-4 (-9-4)	-4 (-8-0)	0.544	-4 (-9-0)	-5 (-8-0)	0.610
ADL VAS	-4 (-9-4)	-5 (-8-0)	0.611	-4 (-9-0)	-5 (-8-1)	0.606
PPT Newton/cm2	0.5 (-3-2)	0.5 (-3-4)	0.765	0.5 (-7-3)	0.5 (-3-2.5)	1.000
Hand Grip Strength	2 (-1-10)	1.9 (-0.3-16.4)	0.706	5.5 (-0.4-13.4)	4 (-1-13.4)	0.344
PRTEE Pain	-14.03 (7.21)	-13.32 (7.73)	0.923	-14.93 (6.81)	-13.16 (8.03)	0.535
PRTEE Function	-15.06 (7.49)	-11.95 (7.60)	0.728	-15.29 (7.75)	-12.32 (7.47)	0.774
PRTEE Total	-29.06 (13.67)	-25.17 (13.81)	0.559	-30.12 (13.98)	-25.38 (14.35)	0.956
Sf 12 Physical	6.15 (-0.78-20.43)	7.39 (-2.53-23.39)	0.684	5.68 (0-20.43)	7.39 (-2.88-23.39)	0.559
Sf 12 Mental	2.42 (-6.63-19.33)	-0.07 (-7.63-19.1)	0.231	2.42 (-9.77-15.73)	-0.28 (-22.35-20.21)	0.107

Mean (SD), Median (minimum-maximum), ADL: Activities of daily life, PPT: Pain pressure threshold, PRTEE: Patient rated tennis elbow evaluation, Sf 12: Short Form-12, P<0.05: Significant

Discussion

Our study's results showed that both KT and FB treatments achieved significant improvements in patients' pain, handgrip strength, functions, and quality of life. We also found that neither method is superior to the other method in treating LE.

LE treatment typically aims to reduce pain, alter the muscle-joint load, and improve neuromuscular strength and control [13]. KT has been recently accepted as a popular treatment method [22]. KT is thought to decrease the pressure on muscles, which affects the cutaneous mechanoreceptors (an

effect of neurophysiology), thereby reducing the force applied to soft tissue. KT's other mechanisms of action are as follows: normalizing muscle function through the inhibition of the hyperactive muscles and stimulation of the weak muscles, increasing vascular and lymphatic flow, fixing abnormal muscle, correcting joint function impairment with tension and elevating the skin under the KT, providing more space [23, 5]. Studies examining KT's acute effects emphasized improvements in resting pain intensity and function [24, 25]. These improvements could be explained by a neurophysiological effect, whereby tactile stimulation of the skin and subcutaneous tissue can alter nociceptive input, reduce pain and improve muscle activity [5]. While Goel et al. [24] showed improvements in pain and grip strength, Au et al. [26] did not report any change in grip strength, pain or muscle activity following KT administration. In both these studies, inconsistency has been associated with the taping technique [24, 26]. Goel et al. [24] applied a 'fascial correction' strip tape in addition to a longitudinal KT strip applied to the forearm extensor muscles. This transverse tape has been claimed to reduce pain more effectively when used to reinforce longitudinal tape [27]. Transverse tape application has been reported to improve joint position senses and force reproduction. A reduction in pain has also been reported to enhance proprioceptive functions. Changes in pain are likely to affect changes in function, or otherwise [5]. In our study, we added a 'fascial correction' strip tape to the forearm extensor muscles and a longitudinal KT strip, applying them for three weeks. Two studies evaluating short-term effects have applied two different techniques. A study by Dilek et al. [12] observed improvements in five different pain measurements after facilitator KT was applied twice per week for two weeks for patients with LE. Dilek et al. stated that this recovery increased even more in the sixth week. Similarly, Shakeri et al. [28] reported greater improvement in pain during daily life activities compared to a placebo control group, following the application of three diamond KT in a week. In contrast, neither group demonstrated significant improvements in PPTs or pain intensity during the palpation of a myofascial trigger point in the forearm extensor muscles. Patient-rated pain and disability were improved in both studies [12, 28] when evaluating short-term treatment outcomes.

The previous results regarding KT's effects on grip strength are contradictory. Dilek et al. [12] demonstrated a 29% increase in maximum grip strength after two weeks of facilitating KT treatment. On the contrary, Shakeri et al. [28] found no significant difference in maximum grip strength compared to diamond KT and placebo KT. Another study found a reduction in grip strength [29]. Additionally, studies have reported that therapeutic tape may offer a valuable contribution to multimodal therapy in treating LE [30]. Our results showed a significant improvement in pain, grip strength and function when used with exercise. In the PPT, a significant improvement was noted at the end of patients' three-weeks treatment, but during the sixth week, this improvement did not continue. Studies have reported a correlation between pain severity and PPT. KT causes dimensional force and mechanical pressure on the skin, thereby changing the skin's tension and, consequently, affecting the PPT [23]. Indeed, in our study, we observed this effect during the KT application period. However, we observed that this effect did not

continue during the following untreated period. The results of one previous study showed that pain sensitivity measured with the PPT was related to the severity and duration of symptoms at the baseline [31]. Unlike previous studies, we also evaluated quality of life, and we found a significant improvement in the SF-12's physical and mental components during the third and sixth weeks. Unlike the two previous studies we have mentioned [12, 28], we applied KT for three weeks. Our conception is that pain control positively affects grip strength and function by increasing exercise compliance, which increases quality of life. Additionally, the application technique and time of the application may play a role in KT's short-term effectiveness.

One of the more popular treatments in LE is the use of a proximal FB, also known as a 'counterforce brace'. The theoretical basis of FB use is its reduction in the wrist extensor muscles' activity during functional activities [32]. The literature has proposed the two most common mechanisms of action for FB. According to the first theory, FB narrows the forearm muscle system and prevents full muscle contraction. This inhibition of muscle dilatation reduces the magnitude of muscle contraction, and accordingly, tension in the musculoskeletal unit proximal to the FB decreases. The second theory suggests that FB applies direct compression to the extensor carpi radialis brevis (ECRB) muscle belly. This compression is assumed to create a secondary origin in the lateral epicondyle. Electromyographic (EMG) studies confirmed reduced EMG activity in the forearm muscle system when treated with the forearm support band [33]. The use of a brace increases proprioception, thereby improving the biomechanics of the joint, reducing overuse, and increasing the pain threshold [34].

A placebo-controlled study reported that the use of FB to treat LE achieved a significant improvement in pain frequency and severity over the short term and at the 26th week of function. These results were preserved for one to four years of follow-up [16]. On the contrary, a study by Wuori et al. [17] found no effect on grip strength from FBs. Meyer et al. [18] reported that using a brace to treat LE decreases the muscle load and reduces pain, leading to a stronger muscle contraction and, thus, increasing grip strength. Bisset et al. [35] reported that braces' immediate effect on LE patients improved painless grip strength and the PPT. Our results showed that FB improved pain, grip strength and function at the third and sixth weeks. Improvements in PPT were observed at the sixth week. The SF-12's physical component showed a significant improvement at weeks 3 and 6, whereas the mental components showed no significant improvement. This difference might have resulted from individual variations.

Kachanathu et al. [32] showed that the application of FB in LE treatment provides significantly better handgrip strength and functional improvement than elbow taping and conventional therapy. On the contrary, Phadke et al. [36] showed that KT – as well as counterforce braces – is equally effective vis-à-vis pain, grip strength and decreasing disability in patients with LE. Our results supported the results of Phadke et al. and showed that both treatment methods similarly affect pain, PPT, grip strength, function and quality of life. Also, the cost of a roll KT and the cost of FB were similar. KT and FB also have biomechanically similar effects, and both reduce power on the lateral epicondyle

[18]. The transverse tape could simulate a counterforce brace, potentially improve pain and pain-free grip strength when applied to a similar location [37]. In our study, we applied a transverse 'fascial correction' strip band in addition to a longitudinal KT strip applied to the forearm extensor muscles for three weeks. Kachanatsu [32] used the elbow taping method for two weeks. Phadke et al. [36] used the inhibitory and space corrective method for the first three weeks and the facilitatory method for the last three weeks of treatment. Differences in application time and techniques may have led to these contradictory results.

Limitations

Our study involved a short follow-up period of six weeks and included two groups' comparisons: FB and KT. In the study by Bisset et al. [38], approximately one-third of participants in the control group also showed patient-related global improvement at the sixth week. This improvement suggests that a natural resolution of pain and function occurs within this timeframe. Therefore, we suggest randomized, controlled trials including a wait-and-see group, which should also evaluate longer-term follow-up results.

Conclusion

The results of our study showed that KT and FB treatments of LE significantly improves pain, handgrip strength, functions and quality of life. Moreover, neither method was found to be superior to the other method in this regard. Therefore, FB or KT could contribute to traditional therapy in LE treatment.

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