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ORIGINAL ARTICLE

Comparative Study for the Effectiveness of Dry Needling and Deep Friction Massage in Lateral Epicondylitis

ZAIB-UN-NISA[1], ZAHID MEHMOOD BHATTI[2], ATIF DUSTGIR[3], MARYAM HINA[4], MARYAM RAZZAQ[5], REHAN RAMZAN KHAN[6]

[1]Assistant Professor, Bakhtawar Amin College of Rehabilitation Sciences, BAMDC, Multan, Pakistan.
[2]Associate Professor, Bakhtawar Amin College of Rehabilitation Sciences, BAMDC, Multan, Pakistan.
[3]Associate Professor, Bakhtawar Amin College of Rehabilitation Sciences, BAMDC, Multan, Pakistan.
[4]Assistant Professor, Bakhtawar Amin College of Rehabilitation Sciences, BAMDC, Multan, Pakistan.
[5]Senior Physiotherapist, Bakhtawar Amin College of Rehabilitation Sciences, BAMDC, Multan, Pakistan.
[6]Assistant Professor, Multan College of Physiotherapy, Multan Medical & Dental College, Multan, Pakistan.
Correspondence to: Dr. Rehan Ramzan Khan, Email: rehan99physio@gmail.com, Cell: 0334- 3074756

ABSTRACT

Objective: To compare the effectiveness of dry needling and deep friction massage in the management of patients with lateral epicondylitis.

Methodology: Thirty two patients with lateral epicondylitis were divided into two groups using lottery method who were meeting the inclusion & exclusion criteria. Both groups (Group A deep friction massage and Group B dry needling) received six treatment sessions at frequency of two sessions per week. Assessments were conducted before intervention and after the end of 2nd, 4th and 6th intervention session using numeric Pain Rating Scale (NPRS), patient related tennis elbow evaluation questionnaire (PRTEEQ) and pain free grip strength using a hand dynamometer.

Results: The mean pain reduction in dry needling and deep friction massage group was 3.52 ± 0.59 and 2.86 ± 0.64 respectively making dry needling a better intervention in reducing pain. The mean change in the total score of PRTEEQ across dry needing and deep friction group was 22.35 ± 7.07 and 20.26 ± 7.18 respectively making both intervention equally effective in reducing pain. In terms of mean change in the strength across dry needing and deep friction group was 7.412 ± 0.563 and 7.533 ± 0.624 respectively making both intervention equally effective in improvement of strength in patients with lateral epicondylitis.

Conclusion: This study suggests that both dry needling and deep friction massage are effective in the improvement of strength and in reducing pain but comparing mean difference of pre and post outcome measure score dry needling is a better intervention in reducing pain in patients with lateral epicondylitis.

Key words: Tennis Elbow, Deep Friction Massage, Dry Needling

INTRODUCTION

Lateral Epicondylalgia (L.E) is commonly known as tennis elbow or lateral epicondylitis. The latter terms can be misleading as only 5-10% of the cases of L.E are caused by playing tennis, but within the tennis community, 50% of players will suffer from L.E at some point in their life (1). The clinical diagnosis is based on local pain anterior or just distal to the lateral epicondyle with palpatory tenderness over this area, especially with resistance to wrist or middle finger extension. In this context, L.E is one of the most common lesions of the upper limb (2) and is the most commonly diagnosed injury of the elbow (1); it results from repetitive micro trauma and is considered an overuse injury (2). The angiofibrotic dysplasia of L.E most commonly affects the proximal attachment of the extensor carpi radialis brevis (ECRB) tendon(3), but the extensor digitorum communis is also affected in a third of patients (4).

Lateral epicondylalgia has a prevalence of 1-3% in the general population and has a peak incidence between 34 and 54 year old. Most often (75%) L.E is found in the dominant arm (5). Lateral epicondylalgia has a natural recovery course of between six months and two years; however, chronic cases have been known to persist for up to 8 years. The majority of cases (35-64%) are due to occupational stresses, and L.E is commonly found in golfers, squash players, bricklayers, carpenters, violinists, housewives, dentists, surgeons and anyone else who is involved in repetitive motions, particularly forearm rotation and wrist flexion and extension (6).

There are multiple publications on L.E but the studies have a large diversity of methods and often result in inconclusive findings. For this reason, there is evidence that suggests the effectiveness of particular treatments, but the optimum treatment for L.E is still unknown (7-9). Some of the more common treatment options that L.E sufferers utilize are: stretching and strengthening exercises, ergonomic counseling, education, manipulation, friction massage, steroid injection, orthotic braces and therapeutic ultrasound (1, 2, 6, 10). Despite there being multiple studies, there is no conclusive evidence regarding best treatment approach for the management of lateral epicondylalgia. Therefore this study was conducted to find out the best treatment approach whether deep friction massage or dry needling for the treatment of L.E.

METHODOLOGY

A Quasi experimental study was conducted in the department of Physical Therapy of Bakhtawar Amin Memorial Trust Hospital, Multan. For data collection non-probability purposive sampling technique was used. A sample size of thirty two patients with lateral epicondylitis meeting selection criteria was included in study. The sample was divided into two groups using lottery method. Inclusion criteria of study were as follows: Both male and female participant (age range 18–40 years) presenting to

the physiotherapy clinic with tenderness and local pain on the lateral aspect of elbow and positive pain provocation tests consisting of resisted active wrist and middle finger extension as well as Mill's maneuvers to passively stretch the extensor muscles and tendons of the forearm (11). Insidious onset of symptoms present for less than three months with no history of trauma to the elbow joint. Participants were required to have myofascial trigger points in the extensor muscles and tendons of forearm as well as restriction/s of the elbow joint. Exclusion criteria includes: participant suffering from the following contraindications to dry needling and cross friction massage: arthritis, local infection, hemophilia, malignancy and anticoagulant therapy or aspirin drug and the participant who suffered from chronic lateral epicondylitis which lasted more than three months. Both groups (Group A deep friction massage and Group B dry needling) received six treatment sessions at frequency of two sessions per week. Assessment were conducted before intervention and after the end of 2nd, 4th and 6th intervention session using numeric Pain Rating Scale (NPRS), patient related tennis elbow evaluation questionnaire (PRTEEQ) and pain free grip strength using a hand dynamometer. The data was analyzed by using SPSS for version 17. Data were presented as mean and S.D± values. Descriptive statistics were calculated for general characteristics of data. Wilcoxon t test was used to show the progress of two groups between any two successive visits in terms of subjective and objective measurements. Friedman ANOVA was used to show change of subjective as well as objective measurements over time. Non-parametric tests used to compare paired groups and to compare two populations at different various intervals which includes Friedman ANOVA and Independent sample t test respectively.

Treatments Groups:

Group A: Deep Friction Massage: The patient sat in comfortable position with their arm pronated with elbow flexed to 90 degrees and arm flexed. The researcher sat along the participant facing their forearm and applied cross friction to the common extensor tendon of the forearm using tips of their thumbs or fingers. The massage was applied perpendicular to the tendon fibers for 12-15 seconds, released for 3-7 seconds and then reapplied for another 15 seconds. Application was continued until there was a perceived softening of the underlying tissue (12). The participant was then instructed to stretch the muscle with their elbow extended, forearm pronated and, wrist flexed with slight ulnar deviation. This stretch was held for 30 seconds

Group B: Dry Needling: A safe needling protocol was followed when treating the participants. The researcher first identified the myofascial trigger point using the above mentioned characteristics. The area was then cleaned with an alcohol swab. The researcher then opened up two needles in front of the participant, one for the muscular myofascial trigger point and one to insert into the common extensor tendon of the forearm. The needles were then placed in a sterile dish and a latex glove was put on to the hand that was to come in contact with the participant's skin. Another alcohol swab was then used to clean the participants involved area and the researchers gloved hand. The needles were then inserted into the relevant myofascial trigger points. The needle was directed perpendicular into the myofascial trigger point of extensor carpi radialis brevis, extensor carpi radialis longus, Extensor carpi ulnaris, supinator muscle, Extensor digitorum and brachioradialis muscles. (13). The needle was left in for seven to ten minutes after which it was removed and the area was ischaemically compressed using an alcohol swab to prevent any bleeding. Moist heat was then applied to the participant after whom they were instructed to stretch the muscle with their elbow extended, forearm pronated and, wrist flexed with slight ulnar deviation. This stretch was held for 30 seconds(13).

RESULTS

Thirty two patients included in study with 20 male and 12 female. Mean age in deep friction group was 28.1 while in dry needling group was 29.4. Other general characteristics of patients like height, weight, BMI, marital status and pain type elaborated in table-I.

Table-I: General Characteristics of Subjects

Characteristic		Deep Friction Massage (n=15) (Group A)		Dry Needling (n=17) (Group B)
Gender	Male	13 (86.7%)		07 (41.2%)
	Female	02 (13.3%)		10 (58.8%)
Age (year)		28.1 ±3.7		29.4 ±5.075
Height (Meter)		1.6 ±.061		1.6 ±.0518
Weight (kg)		71.2 ±8.72		75.2 ±7.301
BMI (kg/m^2)		26.9 ±3.87		28.7 ±3.22
Marital Status		Single	7 (46.7%)	7 (41.2%)
		Married	8 (53.3%)	10 (58.8%)
Pain Type		Acute	6 (40.0%)	5 (29.4)
		Sub-Acute	3 (20.0%)	6 (35.3%)
		Chronic	6 (40.0%)	6 (35.3%)

Table-II: Across the Group Comparison of NPRS and Hand Grip Strength

		P-value	Mean Difference	t	Degree of freedom (df)
NPRS	Pre Treatment	0.99	0.003	.009	30
	Post Treatment W1	0.53	-.231	-.625	-.625
	Post Treatment W2	0.22	.333	1.238	1.238
	Post Treatment W3	0.06	.666	1.903	1.903
Hand Grip Strength	Pre Treatment	0.87	.117	.157	30
	Post Treatment W1	0.73	.188	.349	30
	Post Treatment W2	0.32	-.396	-.994	30
	Post Treatment W3	0.59	.239	.538	30

Independent samples T test was applied to determine any significant difference across the two treatment group in terms of NPRS for pain and hand grip strength measured using hand dynamometer. The post treatment reading at week 1, 2 and 3 showed no significant difference across

the two treatment group with p value > 0.05. (Table- II) Independent sample T test was applied to determine any significant difference across the two treatment group in terms of function and pain sub scale of Patient Reported Tennis Elbow Evaluation Questionnaire (PRTEE). The post treatment reading at week 3 showed no significant difference across the two treatment group with p value > 0.05. (Table- III). The mean pain reduction in dry needling group was 3.52 ± 0.59 compared to 2.86 ± 0.64 across deep friction group making dry needling a better intervention in management of pain in patients with lateral epicondylitis. However change in the strength across dry needing and deep friction group was 7.412 ± 0.563 and 7.533 ± 0.624 respectively making both interventions equally effective in improvement of strength in patients with lateral epicondylitis. (Table- IV)

Table-III: Across the Group Comparison of PRTEE total and subscales

Measure		P-value	Mean Difference	t
PRTEE Total Score	Pre Treatment Score	.307	-1.866	-1.039
	Post Treatment Score	.900	.219	.127
PRTEE-Function Subscale	Pre Treatment Score	.058	-1.73	-1.974
	Post Treatment Score	.350	-1.113	-.948
PRTEE-Pain Subscale	Pre Treatment Score	.930	-.129	-.088
	Post Treatment Score	.259	1.333	1.150

Table-IV: Within the group comparison of NPRS and grip strength and PRTEE

Measure	Group	Baseline	Final	Within Group Change	P value
NPRS	Deep Friction Massage	6.53 ± 1.30	3.66 ± 0.81	2.86 ± 0.64	0.00
	Dry Needling	6.52 ± 1.06	3.00 ± 1.11	3.52 ± 0.59	0.00
Hand Grip Strength	Deep Friction Massage	18.00 ± 2.17	25.53 ± 1.30	7.533 ± 0.624	0.00
	Dry Needling	17.88 ± 2.06	25.29 ± 1.21	7.412 ± 0.563	0.00
PRTEE Total Score	Deep Friction Massage	77.13 ± 5.50	56.86 ± 4.88	20.26 ± 7.18	0.00
	Dry Needling	79.00 ± 4.66	56.64 ± 4.87	22.35 ± 7.07	0.00

DISCUSSION

This study compared the effects of dry needling and deep friction massage in subjects with lateral epicondylitis. The mean pain reduction in dry needling group was 3.52 ± 0.59 compared to 2.86 ± 0.64 across deep friction group making dry needling a better intervention in management of pain in patients with lateral epicondylitis. In terms of mean change in the strength across dry needing and deep friction group was 7.412 ± 0.563 and 7.533 ± 0.624 respectively making both intervention equally effective in improvement of strength in patients with lateral epicondylitis. The mean change in the pain subscale across dry needing and deep friction group was 12.59 ± 5.16 and 11.06 ± 5.22 respectively making both intervention equally effective in reducing pain in patients with lateral epicondylitis. The mean change in the function subscale across dry needing and deep friction group was 9.82 ± 3.50 and 9.20 ± 3.94 respectively making both intervention equally effective in reducing pain in patients with lateral epicondylitis. The mean change in the total score of PRTEE across dry needing and deep friction group was 22.35 ± 7.07 and 20.26 ± 7.18 respectively making both intervention equally effective in reducing pain in patients with lateral epicondylitis.

Dry needling, cross friction and chiropractic manipulation targets increasing the blood flow to the injured area and restoring normal joint movement allowing for the healing of the damaged tissues(14). The restoration of joint movement and healing of damaged tissues could be responsible for the increase in the pain threshold which the participants experienced.

There are many mechanisms by which dry needling produces its effects, such as mechanically disrupting abnormal contractile elements or nerve endings and causing a local release of intracellular potassium resulting in a depolarization block of nerve fibers (13). Kalichman et al.(15), concluded that dry needling is a treatment being employed more recently by physicians and physical therapists in the treatment of L.E. They stated that dry needling is minimally invasive, cheap and carries a low risk. In terms of dry needling in the treatment of L.E, Haswell (16) showed that it may be an effective method in treating L.E. And this effectiveness has been confirmed and its use has been recommended by Kalichman et al.(15). In a study by Shaik (17), Mill's manipulation and cross friction were compared to cross friction alone and neither was found to be any more effective than the other. In a study by Marquis (18), dry needling and cross friction combined were found to be more effective than cross friction massage on its own. Hughes (19) found that combining elbow manipulation with dry needling and combining manipulation with cross friction massage both produced significant improvements (p=0.05) in all measurements.

CONCLUSION

This study suggests that both dry needling and deep friction massage are effective in the improvement of strength and in reducing pain but comparing mean difference of pre and post outcome measure score dry needling is a better intervention in reducing pain in patients with lateral epicondylitis.

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