

Effectiveness of Dry Needling on Lateral Epicondylitis Patient Compared to Ultrasound Therapy

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Abstract

Background: The goal of study is to assess the effectiveness of dry needling and ultrasound therapy on lateral epicondylitis patients.

Purpose: To compare the effectiveness of dry needling on lateral epicondylitis patients compared to ultrasound therapy.

Materials and Methods: Ninety subjects with lateral epicondylitis (both male and female) divided in two groups. Group "A" acquired dry needling two days a week for a period of two weeks and Group "B" acquired ultrasound therapy four days a week for a period of two weeks. Visual Analogue Scale, Patient-rated tennis elbow evaluation were used to assess patients in before and after treatment. Study period: November 2022 to April 2023.

Result: Based on data analysis both visual analogue scale and patient rated tennis elbow evaluation values in each group are significantly different in before and after treatment having $p < 0.0001$ for each group. In Group analysis is highly significant with $p < 0.0001$ for VAS, $p < 0.0001$ for PRTEE dry needling is greater in lowering discomfort and increasing mobility.

Conclusion: Dry needling is more effective than ultrasound therapy in lateral epicondylitis.

Key Words: Lateral epicondylitis, Dry needling, Ultrasound therapy, VAS, PRTEE

Introduction

Tennis elbow is a painful condition that most commonly occurs in the dominant hand due to the inflammation of tissue around the lateral epicondyle of the humerus. Most commonly affected in both men and women such as the driver of the construction site and office workers are equally affected that may increase with age. Continuous straining games such as badminton leads to ligament strain.¹ However, the

cause of the tennis elbow is unknown even though it occurs at the minor level. Most people experience pain at the point of medial and distal aspect as well as excessive flexion of the elbow.² Tennis elbow is treated with the ice, bracing, non-steroidal drugs if it is chronic the patient is initiated for physiotherapy. There are several techniques available for the treatment of tennis elbow, it includes ultrasound, massage, manual techniques, dry needling, and exercise therapy as

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well as electrotherapy. Lateral aspect of the elbow is evaluated by facing the thumb upward and elbow in semiflexion. The continuous tension over the tendon is prevented by keeping the elbow joint in a relaxed position. While, during the resisted wrist extension and radial deviation can evaluate the tenderness over lateral epicondyle of humerus.³ Dry needling is also called the intramuscular stimulation which involves inserting the needle into the muscle and skin. Trigger point with the dry needling is used to treat the palpable taut band structures and the muscular problems. The effect of the therapy is involving alone or with the combination of the treatment for the patient regarding to the pain progressiveness and its impairment.⁴ It results in reducing the growth factors and enhances the blood circulation.⁵ Ultrasound is most commonly used among the physical therapy, it increases the blood flow, reduces the pain and improves the tissue repair.⁶ The pain which is regional is successful with the dry needling.⁶ Dry needling helps to treat the chronic pain.⁷ When the resistance is applied over wrist extension and radial deviation that causes pain and discomfort over lateral epicondyle of humerus.⁹ Before the initiation of treatment, pain is evaluated by visual analogue scale and finger dynamometer is used to measure the grip strength and pinch strength.¹⁰ The condition is treated by placing the head of the ultrasound over the painful area. Low pulsed ultrasound is helpful in repairing the tissues and enhances the process of healing. The normal function of both affected and unaffected hand is tested to identify the improvement. However, lateral epicondylitis is the slow progressive condition.¹¹ Overall treatment of the tennis elbow is to reduce the pain and improve the functional activity. The most frequently involved structure in the lateral epicondylitis is the origin of extensor carpi radialis brevis.¹² Exercise therapy includes strengthening exercise and stretching exercise whereas strengthening exercise is used to improve the grip strength & reduces the pain. Rehabilitation programs improve the duration of recovery in patients with lateral epicondylitis. If the patient with tennis elbow is untreated it may lead to chronic pain. The pain experienced during rest is measured by the visual analogue scale. The subject is allowed to mark the level of the pain. The patient rated tennis elbow evaluation consists of 15

questionnaires which is used to measure the activity of the individual with tennis elbow.¹³ It includes that extensor carpi radialis brevis tearing muscle leads to pain at the origin of extensor.¹⁴ The duration of each session is about 10 minutes. It improves the blood flow, enhances the permeability of the membrane and reduces the inflammation of the tissues. So, the pain over lateral epicondyle of humerus due to the excessive pressure on the joint may be diagnosed as the lateral epicondylitis.¹⁵ Releasing the trigger points is very simple and takes a few minutes. Most commonly releasing the triggers in forearm muscle. Patients are most commonly advised to do the concentric and eccentric type of the exercises to improve the grip strength.¹⁶ Dry needling improves the range of motion, lowers the tone of muscle and decreases the discomfort.¹⁷

Aim

To compare the effectiveness of dry needling and Ultrasound therapy on lateral epicondylitis patients.

Materials and Methods

This experimental study was conducted from November 2022 to April 2023 by Dr. Milton's Physiocare. Age group between 18-50 years, Weakness with gripping, Pain on palpation over lateral epicondyle of humerus were performed in this study. This type of study is a convenient sampling technique.

Inclusion Criteria

- Age 18-50 yrs.
- Weakness with gripping.
- Pain on palpation over lateral epicondyle of humerus.
- Cozen test, Mill's test, Middle finger extension test was confirmed.

Exclusion Criteria

- Radio-ulnar and radial-humeral osteoarthritis.
- Recent trauma and fracture.
- Recent surgery.
- Peripheral nerve entrapment.

Outcome Measures

- Visual Analogue Scale (VAS).
- Patient-rated tennis elbow evaluation (PRTEE).

Procedure

Participants were selected based on conditions. The detailed Procedure for performing the study was explained to subjects and informed consent was collected from them before starting the study.

Dry Needling Group

Subject Position: Patient was made to sit in a comfortable position and the arm well supported on the pillow with elbow flexed to 90°, forearm in pronation and wrist in comfortable position.

Technique: A 0.25mm diameter of acupuncture sterilised needle is utilised to expose the treatment area. Before the treatment, the exposed area was wiped with disinfectant. Then, palpate the nodules to position a fine needle and plastic guide tube over a myofascial trigger point and perform tapping movement to cause a twitch response. When a needle was placed into a trigger point penetrated at a 30 degree angle, the fanning technique was used, and the needle was held for a few seconds before removing. Use a Cold pack for 10 minutes twice daily after the procedure to decrease post-needling discomfort. This procedure was given two days a week for a period of 2 weeks.

Ultrasound Therapy Group

Subject Position: Patient was made to sit in a comfortable position and the arm well supported on the pillow with elbow flexed to 90°, forearm in pronation and wrist in comfortable position.

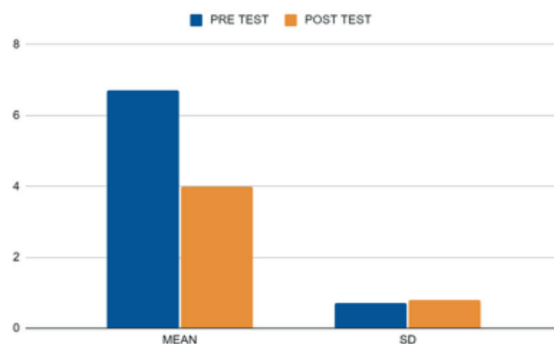
Technique: Remove all jewellery that interfered with the application. Patient was encouraged to inform the therapist if discomfort occurs. Gel applied to the Ultrasound head. The head of the ultrasound is done in circular motion. Pulsed ultrasound with 1MHZ frequency was given with an intensity of 1-2 w/cm at the point of tenderness around the lateral epicondyle region for 8 minutes. This procedure was given four days a week for a period of 2 weeks.

Exercise Programme

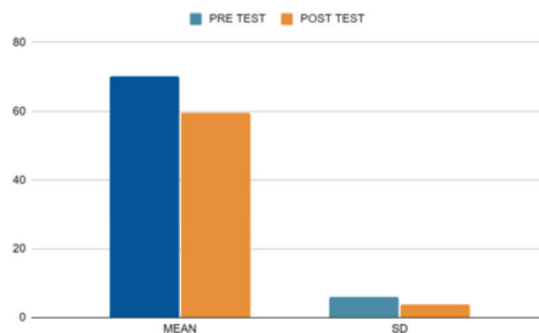
(10 repetitions, 3 sets, 10 seconds hold)

- Isometric supination and pronation
- Supination with dumbbell
- Isometric elbow flexion
- Isometric elbow extension
- Wrist extension with dumbbell
- Fist clench
- Towel twist

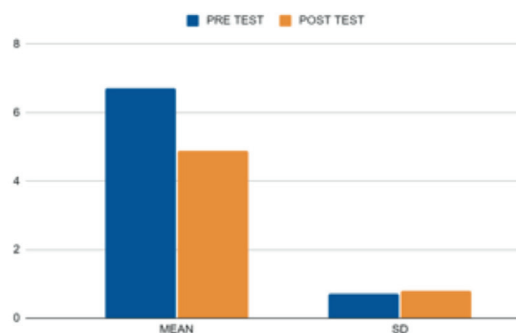
Data Analysis



Graph-1 Paired t-test by using VAS (Dry Needling Group).



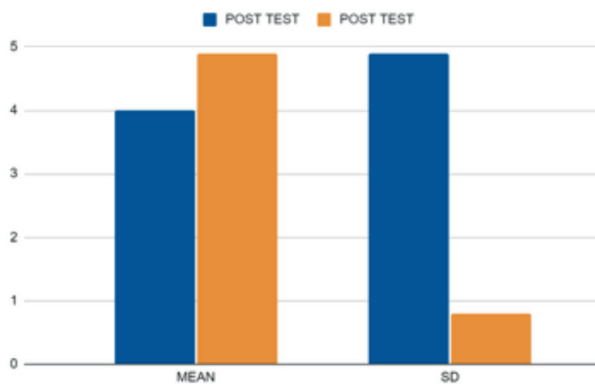
Graph-2 Paired t-test by using PRTEE (Dry Needling Group)



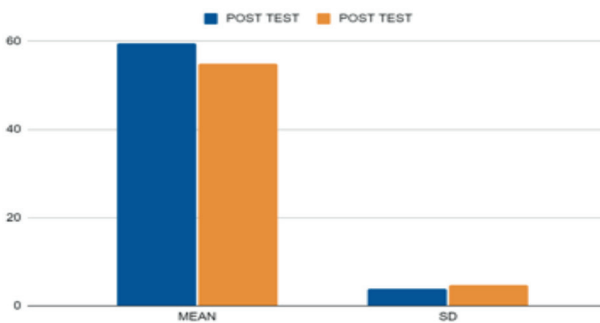
Graph-3 Paired t-test by using VAS(Ultrasound Therapy Group)



Graph-4 Paired t-test by using PRTEE (Ultrasound Therapy Group)



Graph-5 Both Groups Unpaired t-test by using VAS



Graph-6 Both Groups Unpaired t-test by using PRTEE

Result

The 90 individuals participated in the study. There were 45 participants in each group. For visual analogue scale, the mean was 4.04 for Dry needling group and 4.97 for Ultrasound therapy group, p value was <0.0001 and t value was=5.2990 which shows

that the result was statistically significant. For patient rated tennis elbow evaluation, the mean was 59.58 for Dry needling group and 54.93 for Ultrasound Therapy group, p value was <0.0001 and t-value was=5.0216 indicates highly significant.

Discussion

Goal of the study was to compare the effectiveness of dry needling on lateral epicondylitis patients compared to ultrasound therapy. To assess the effectiveness in terms of lowering discomfort and increasing mobility. This comparison is demonstrated with a duration of 2 weeks. In this study 90 subjects were assigned 45 were in the Dry needling group and 45 were in Ultrasound therapy group. Dry needling group two days a week for a period of 2 weeks and Ultrasound therapy group four/times a week for a period of 2 weeks. Both groups received the same set of exercise programmes. The outcome result was measured by visual analogue scale and patient rated tennis elbow evaluation before and after treatment. Based on statistical analysis, both groups showed improvement in visual analogue scale and patient rated tennis elbow evaluation However, subjects in the dry needling group with exercise showed better improvement in visual analogue scale and patient rated tennis elbow evaluation than the subjects in the ultrasound group with exercise. Alireza Kheradmandi, Maryam Ebrahimian, et al., has concluded that tennis elbow syndrome patients’ discomfort and sensitivity in their hand extensor muscles improve more significantly when dry needling is combined with regular physical therapy.⁶ Esat Uygur, Birol Aktaş, et al., has concluded that during the six-month follow-up period, both dry needling and corticosteroid injections markedly improved lateral epicondylitis. However, dry needling delivered superior results. We experienced modest negative effects with corticosteroid injections; as a result, such injections need to be reviewed.⁷ Zahid Mehmood Bhatti Zaib-un-nisa, Atif Dustgir, et al., has concluded that deep friction massage and dry needling are equally effective at improving force and lowering discomfort in patients with lateral epicondylitis. However, when comparing the mean difference between pre- and post- outcome measure scores, dry needling is a more effective intervention.⁸ Nensi v Gandhi, Dharmag Vyas, et al., has concluded

that when treating lateral epicondylitis, dry needling was discovered to be more effective than the mulligans approach alone in reducing pain and increasing functional impairment.¹⁵ Jorge Sanchez-Infante, Marcos J Navarro- Santana, et al ., has concluded that physical therapist use dry needling was superior to other treatment for pain management in tennis elbow.¹⁶

Conclusion

Dry needling and ultrasound therapy along with strengthening exercises reduces pain and improves the range of motion on Lateral epicondylitis, dry needling appears to be more effective than ultrasound therapy in reducing pain and increasing the range of motion in patients with lateral epicondylitis.

Ethical Clearance: The research work has been approved by the ISRB. (Application no: 03/075/2022/ISRB/SR/SCPT)

Funding: Self

Conflict of Interest: Nil

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