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Original Research Article

The Effect of TENS along with NSAIDS and Exercises in Lateral Epicondylitis: A Randomised Control Study in a Tertiary Care Hospital in Bangladesh

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Abstract: ***Background:*** Lateral Epicondylitis (LE) affects the upper limbs. Studies examined many management strategies. No method works. Noninvasive therapeutic ultrasound can cure lateral epicondylitis. Studies show a placebo effect. Low cost, convenience, non-invasiveness, and few contraindications make TENS popular for lateral epicondylitis. ***Objective:*** To see the effect of TENS along with NSAIDS and exercises in Lateral Epicondylitis**.** ***Methods:*** After protocol approval, the DMCH Physical Medicine and Rehabilitation department conducted this six-month randomized clinical experiment. Lateral epicondylitis outpatients were invited. 30 TENS patients transcutaneous electrical nerve stimulation, NSAIDs, omeprazole, and therapeutic exercise. Final follow-up was 6 weeks following initial appointment. Participants provided written consent. SPSS 21 analyzed data**.** ***Results:*** The study population's mean age was 38.78 ± 6.09 SD (years) [31-50 years], with 50%% male and 50%% female. The mean age was 38.03±6.01 SD (years), respectively. Before intervention, the group distribution was homogenous (p>0.05). After 6 weeks, both groups showed significant improvement in VAS score and grip strength 3.40±0.97 and 38.50±9.06; p<.001). ***Conclusion:*** Overall improvement is noticed in TENS therapy. As a result, it can be concluded that TENS is safe and effective technique as a treatment option of lateral epicondylitis. However, further larger studies are needed to finalize the comment.

Keywords: TENS, NSAIDS, Lateral Epicondylitis.

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Introduction

Pain on the outer side of the elbow is a hallmark of tennis elbow, or lateral epicondylitis. The dominant arm is typically affected, and onset typically occurs between the ages of 30 and 60. Around 1% to 3% of the population suffers from this painful elbow ailment. The reported incidence of lateral epicondylitis is 3.4 per 1000 people, with the highest rates seen in individuals aged 40–49 years old in males and 50–59 years old in females.[1-3] Primary tendinosis of the extensor carpi radialis brevis, with or without involvement of the extensor digitorum communis, has been linked to overuse of the ECRB muscle, and the inflammation that results from this is assumed to be the cause of this condition (EDC).[4] Predisposition to the ailment may be increased in

tennis since the wrist extensors are used so frequently throughout the game. However, overuse of the tendon can occur in the general population for a variety of reasons, including but not limited to the demands of one's occupation.[5] About 14% of people diagnosed with lateral epicondylitis have jobs that require frequent, forceful use of the wrists or hands. The most common symptom is pain that gets worse with grasping, lifting, or other routine everyday activities.[6] Patients with symptoms including discomfort and decreased functionality often isolate themselves.[7] Approximately 30 percent of patients who report sick leave use up an average of 4.5 to 5 days each year. Pain typically subsides within a year, and more than 80% of patients are projected to improve (full or partial recovery) within that time frame.[8, 9] Despite the fact that lateral epicondylitis has been recognized for quite some time, there is still no consensus on the disease's exact origin and pathology. As a result, there are no set standards for how to treat this excruciatingly painful and debilitating illness.[10] Approximately the years, over forty treatments have been proposed for lateral epicondylitis.[11] Doctors frequently used non-steroidal anti-inflammatory medicines, splinting, exercises, massage, manual treatment, and physiotherapy.[12] Additional options for patients that do not respond to these medications include local injectable therapy and possibly surgery. However, there is currently no one treatment that has been shown to be successful for the vast majority of individuals.[13] Therefore, in recent years, a number of different instrumental electrophysical modalities, including ultrasound, extracorporeal shock wave therapy (ESWT), transcutaneous electrical nerve stimulation (TENS), and laser therapy, have been tested and used to treat lateral epicondylitis.[14, 15]

Objectives

To see the effect of TENS along with NSAIDS and exercises in Lateral Epicondylitis.

Methods

This randomized clinical trial lasted for six months, and it was run by the Physical Medicine and Rehabilitation department at DMCH after the protocol was approved. Attendees included those who sought treatment for lateral epicondylitis in the community. Lateral epicondylitis affected 30 people who used TENS and 30 people who used UST. They were divided into two groups for statistical analysis by means of a random lottery (1:1): Therapeutic exercise, nonsteroidal anti-inflammatory drugs, omeprazole, and TENS make up Group A, while ultrasonography is used in Group B. All of the patients were treated with rest and therapeutic exercise for a full six weeks. The last check-in occurred six weeks after the original consultation. All of the volunteers signed a waiver.

Inclusion criteria:

Age: 30 to 50 years
Sex: Both sex
Pain lasting for more than 3 weeks over lateral epicondyle of dominant hand
Tenderness over lateral elbow region of dominant hand
Pain with any two of the following three tests:

Exclusion criteria

Bilateral lateral epicondylitis
Any nodule ulcer or ganglion on lateral epicondyle
Any surgery around elbow
Trauma over elbow
Systemic metabolic disease- DM, thyroid disease
Chronic inflammatory diseases-Rheumatoid arthritis, Seronegative spondyloarthopathy
Cervical spondylosis
Carpal tunnel syndrome
Intralesional injection over the site with corticosteroid or local anesthetic in last 6 months
Any peripheral nerve injury

Data Processing and Analysis

Statistical analysis was carried out with the help of SPSS 21.0 (Statistical Package for the Social Sciences). The ages and other continuous variables were presented as means SDs, and the student t test was used to compare the two groups. Values for nominal variables (gender, age, etc.) were reported numerically and graphically. The paired t-test compared the means of the same groups throughout time, while the independent t-test compared the means of the distinct groups. The cutoff for considering something statistically significant was set at 0.05.

Results

Out of 30 LE patients, majority were from age group 30 to 35 years. The mean age of patients was 38.78 ± 6.09. Minimum age of the patients was 30 and maximum age of the patients was 50.

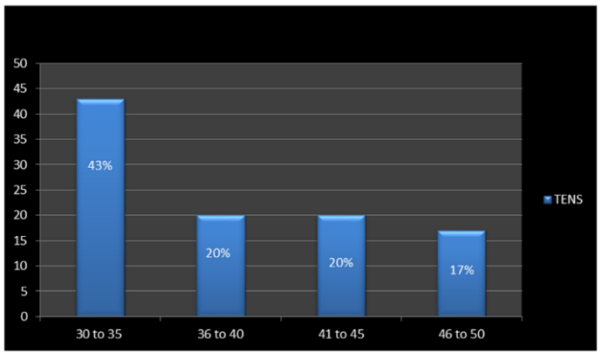

Figure 1: Age distribution of the patients

Overall, in TENS group, 50% was female and 50% were male patients.

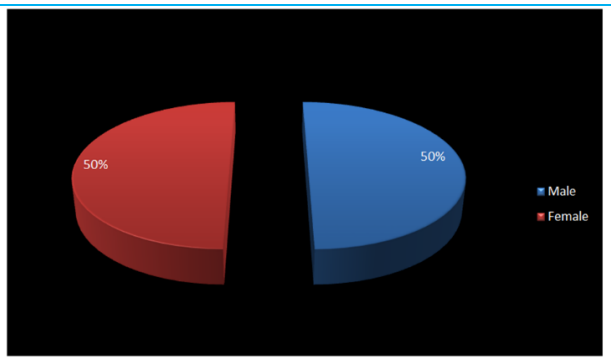

Figure 2: Sex distribution of the patients

Of 30 patients, majority 97% patients had tenderness, 17% patients had swelling and 7% patients had elevated joint temperature as the symptoms of lateral epicondylitis. Only 2% patients had crepitus in joint movement. Total of 33% patients had pain for last two to six months. Long term pain like pain duration for more than one year was common for 28% patients. 22% patients had pain for less than one month and 17% patients had pain for last seven months to one year.

Table 1: Clinical presentation and duration of pain among patients, (n=30)

Clinical presentation	Frequency	Percentage (%)
Tenderness	58	96.7
Swelling	10	16.7
Elevated joint temperature	04	6.7
Crepitus in joint movement	01	1.7
Positive Cosen's test	60	100%
Positive Mill's test	60	100%
Duration of pain		
Less than one month	13	21.7
Two to six months	20	33.3
Seven months to one year	10	16.7
More than one year	17	28.3

The baseline VAS score was 7 7.07±1.63 in TENS group. The difference was not statistically significant (p>0.05). Base line grip strength was 33.63±71 in UST and 33.80±8.38 in TENS group. The distribution was homogenous (p>0.05).

Table 2: Comparison of baseline data between two groups for Grip strength and VAS, (n=30)

Variables	Groups	Baseline (mean±SD)	P-value
VAS	TENS	7.07±1.63	
Grip Strength	TENS	33.80±8.38	

For the VAS and grip strength both had significant (p < 0.05) changes from (33.63±7.21) to (40.63±7.66) respectively. Also, for TENS, the VAS and grip strength both has significant (p < 0.05) changes from (33.80±8.38) to (38.50±9.06).

Table 3: Comparison of baseline data and week 6 data for Grip strength and VAS for both groups, (n=30)

Variables	Groups	Baseline(mean±SD)	Week 6(mean±SD)	P-value
VAS	TENS	7.07±1.63	3.40±0.97	<0.001
Grip Strength	TENS	33.80±8.38	38.50±9.06	<0.001

The changes in VAS and grip strength over six weeks was highly significant in TENS group (p<0.001)

Table 4: Comparison of changes in VAS and Grip strength between two groups

Variables	TENS (mean ± SD)	P-value
VAS	3.67±1.71	<0.001
Grip strength	-4.70±2.63	<0.001

P-value is determined by independent samples t-test

Patients' satisfaction after treatment was assessed using CGI score. The lower the score in CGI the higher the satisfaction. Mean CGI score was significant in TENS group (1.8±0.96 vs. 2.4±1.04, p<0.05.

Table 5: Comparison of two groups using CGI values, (n=30)

.	TENS n (%)	p-value
CGI score (mean±SD)	2.4±1.04	0.013

Discussion

Total 30 patients of lateral epicondylitis were taken for this study. Patients aged between 30 to 50 years were included in this study. Mean age of all patients was 38.78±6.09 years. Majority patient belonged to younger age group 30 to 35 years. This finding is concordant with that of Flick *et al*.,.[16] They studied patients between 20 to 60 years and found that majority (60%) patients belonged to the younger age group 20–40 years. This is consistent as Vaquero-Picado noted that lateral epicondylitis mainly affect middle-aged patients.[17] Coonrad and Hooper noted that tennis elbow is four time more common in the fourth decade of life.[18] Majority patients were male in this study. Among TENS group 50% patients were male. Overall, 54.1% patients were male, and 44.3% patients were female. Karbowiak *et al*., similarly found 53.3% male patients and 46.7% female patients in their study entitled "Socio-demographics and clinical profile of patients with lateral epicondylitis".[19] Also, Konarski *et al*., in his thesis regarding risk factors of tennis elbow attending in a tertiary care hospital in Dhaka found that 53.3% patients were male and 46.7% patients were female in his study.[20] It was observed that lateral epicondylitis are more common in hard workers. Park *et al* found that of occupational risk factors, forceful activities, high force combined with high repetition or awkward posture and awkward postures are associated with epicondylitis.[15] Vaquero-Picado noted that any activity involving excessive and repetitive use of extensor muscles of elbow (for example tennis, playing an instrument, typing, and manual work) may cause the tendinosis. This explains why hard manual workers were proportionately high in this study. The most common presentation was tenderness over lateral epicondyle (96.7%) followed in decreasing order by swelling (16.7%), elevated joint temperature (6.7%) and crepitus in joint movement (1.7%). Mill's test and Cosen's test were positive in hundred percent cases. This is comparable with the findings of Karbowiak *et al*.,.[19] They found tenderness in 95% patients, swelling in 13.3% patients and elevated joint temperature in 8.3% patients. They also found positive Mill's test and Cosen's test in 100% patients. In this study patients' pain was assessed using VAS score and strength of the affected arm was assessed by grip strength. Baseline VAS score was 7.07±1.63 in TENS group with the being statistically non-significant (p>0.05). Base line grip strength was 33.80±8.38 in TENS group. The distribution was statistically similar (p>0.05). Yan *et al*., found a baseline VAS score of 6.57±1.41 in TENS group in a similar study entitled "Comparative Study of Ultrasound and Tens in the Management of Tennis Elbow".[21] In TENS group reduction in VAS score from baseline to after two weeks of treatment was statistically significant. In TENS group VAS score improved from 7.07±1.63 to 3.40±0.97. In their study VAS score improved from 6.57±1.41 to 2.81±1.15 in TENS group (p<0.001). Grips strength improved from 33.80±8.38 to 38.50±9.06 in TENS group. In both groups the improvement was statistically

significant (p<0.001). Pellegrino *et al*. compared the effect of ultrasound therapy with laser therapy and brace therapy in lateral epicondylitis patients.[22] Palekar compared conventional TENS with phonophoresis for lateral epicondylitis and found grip strength improved from 30.27±7.69 to 37.77±6.37 in TENS group. Pellegrino *et al* found laser therapy superior and Palekar found phonophoresis therapy superior.[22] UST mediated changes in VAS score and Grip strength was statistically higher than that of TENS mediated changes (p<0.001). Various modalities of treatment are being tested for Tennis Elbow with variable reports on their effect.

Conclusion

Overall improvement is noticed in TENS therapy. As a result, it can be conclude that TENS is safe and effective technique as a treatment option of lateral epicondylitis. However, further larger studies are needed to finalize the comment.

References

1. Ahmed AF, Rayyan R, Zikria BA, Salameh M. Lateral epicondylitis of the elbow: an up-to-date review of management. European Journal of Orthopaedic Surgery & Traumatology. 2023 Feb;33(2):201-6.
2. Kim GM, Yoo SJ, Choi S, Park YG. Current trends for treating lateral epicondylitis. Clinics in Shoulder and Elbow. 2019 Dec 1;22(4):227.
3. Cho Y, Yeo J, Lee YS, Kim EJ, Nam D, Park YC, Ha IH, Lee YJ. Healthcare utilization for lateral epicondylitis: a 9-year analysis of the 2010–2018 health insurance review and assessment service national patient sample data. InHealthcare 2022 Mar 28 (Vol. 10, No. 4, p. 636). MDPI.
4. Lucado AM, Dale RB, Kolber MJ, Day JM. Analysis of range of motion in female recreational tennis players with and without lateral elbow tendinopathy. International Journal of Sports Physical Therapy. 2020 Aug;15(4):526.
5. Lenoir H, Mares O, Carlier Y. Management of lateral epicondylitis. Orthopaedics & Traumatology: Surgery & Research. 2019 Dec 1;105(8):S241-6.
6. Seidel DH, Ditchen DM, Hoehne-Hückstädt UM, Rieger MA, Steinhilber B. Quantitative measures of physical risk factors associated with work-related musculoskeletal disorders of the elbow: a systematic review. International journal of environmental research and public health. 2019 Jan;16(1):130.
7. Wood SM, Yoon AP, Tseng HJ, Yang LY, Chung KC. Comparative effectiveness of physical therapy and electrophysiotherapy for the treatment of lateral epicondylitis: A network meta-analysis. Plastic and Reconstructive Surgery. 2022 Sep 1;150(3):594e-607e.
8. Bonczar M, Ostrowski P, Plutecki D, Dziedzic M, Florek J, Michalik W, Przybycień W, Depukat P, Rutowicz B, Walocha E, Koziej M. Treatment Options for Tennis Elbow—An Umbrella Review. Folia Medica Cracoviensia. 2023:31-58.
9. Luo D, Liu B, Gao L, Fu S. The effect of ultrasound therapy on lateral epicondylitis: a meta-analysis. Medicine. 2022 Feb 25;101(8):e28822.
10. Holmedal Ø, Olaussen M, Mdala I, Natvig B, Lindbæk M. Predictors for outcome in acute lateral epicondylitis. BMC Musculoskeletal Disorders. 2019 Aug 17;20(1):375.
11. Landesa-Pineiro L, Leirós-Rodríguez R. Physiotherapy treatment of lateral epicondylitis: A systematic review. Journal of back and musculoskeletal rehabilitation. 2022 May;35(3):463-77.
12. Yelland M, Rabago D, Ryan M, Ng SK, Vithanachchi D, Manickaraj N, Bisset L. Prolotherapy injections and physiotherapy used singly and in combination for lateral epicondylalgia: a single-blinded randomised clinical trial. BMC musculoskeletal disorders. 2019 Nov 3;20(1):509.
13. Karabinov V, Georgiev GP. Lateral epicondylitis: New trends and challenges in treatment. World Journal of Orthopedics. 2022 Apr 18;13(4):354.
14. Papadopoulos ES, Mani R. The role of ultrasound therapy in the management of musculoskeletal soft tissue pain. The international journal of lower extremity wounds. 2020 Dec;19(4):350-8.
15. Park HS, Jo SM, Dasari S, Moon YL. Comparison of clinical outcomes of platelet-rich plasma for epicondylitis, elbow: simultaneous lateral and medial versus lateral versus medial. Orthopaedic surgery. 2023 Aug;15(8):2110-5.

16. Flick TR, Lavorgna TR, Savoie III FH, O'Brien MJ. Lateral and Medial Epicondylitis. InMRI-Arthroscopy Correlations: A Case-Based Atlas of the Knee, Shoulder, Elbow, Hip and Ankle 2022 May 17 (pp. 301-310). Cham: Springer International Publishing.
17. Argenis G, Juárez MS, Ft PS. Physical Agents and Therapeutic Modalities: Main concepts implicated in Physiotherapy treatment prescription and into advanced physical therapy practice. Practice. 2023;19(6):176.
18. Ali EM, Fekry O, Obeya HE, Darweesh H, Moharram A. Efficacy of high intensity laser versus ultrasound therapy in the management of patients with lateral epicondylitis. The Egyptian Rheumatologist. 2021 Apr 1;43(2):119-23.
19. Karbowiak M, Holme T, Thambyrajah J, Di Mascio L. Management of lateral epicondylitis (tennis elbow). bmj. 2023 May 18;381.
20. Konarski W, Poboży T. A clinical overview of the natural course and management of lateral epicondylitis. Orthopedics. 2023 Jul 1;46(4):e210-8.
21. Yan C, Xiong Y, Chen L, Endo Y, Hu L, Liu M, Liu J, Xue H, Abududilibaier A, Mi B, Liu G. A comparative study of the efficacy of ultrasonics and extracorporeal shock wave in the treatment of tennis elbow: a meta-analysis of randomized controlled trials. Journal of orthopaedic surgery and research. 2019 Aug 6;14(1):248.
22. Pellegrino R, Paolucci T, Brindisino F, Mondardini P, Di Iorio A, Moretti A, Iolascon G. Effectiveness of high-intensity laser therapy plus ultrasound-guided peritendinous hyaluronic acid compared to therapeutic exercise for patients with lateral elbow tendinopathy. Journal of Clinical Medicine. 2022 Sep 20;11(19):5492