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A literature review on the comparative effects of long wave diathermy and conservative physical therapy in the management of medial epicondylitis

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Abstract

Background: Medial epicondylitis, or golfer's elbow, is a common source of elbow pain and functional limitation. While conservative physical therapy (PT) and long-wave diathermy (LWD) are utilized in its management, a direct comparison of their effectiveness is lacking. This study aims to compare the effects of LWD versus a comprehensive conservative PT program on pain, function, and grip strength in patients with medial epicondylitis.

Methods: A randomized controlled trial will be conducted, recruiting patients diagnosed with medial epicondylitis based on standardized clinical criteria. Participants will be randomly allocated to either a LWD group receiving a standardized LWD protocol or a conservative PT group receiving a comprehensive program including therapeutic exercises, manual therapy, and patient education. Primary outcomes will be pain intensity (NPRS), functional capacity (DASH questionnaire), and grip strength (dynamometer), measured at baseline, end of treatment (4 weeks), and follow-up (3 months). Secondary outcomes will include patient-reported global improvement. Data will be analyzed using appropriate statistical methods, including intention-to-treat analysis.

Expected Results: This study anticipates demonstrating the relative effectiveness of LWD and comprehensive conservative PT in improving pain, function, and grip strength in patients with medial epicondylitis. The results will provide evidence-based guidance for clinicians in selecting the optimal treatment approach for this common condition.

Conclusion: The findings of this randomized controlled trial will contribute valuable evidence to the management of medial epicondylitis by directly comparing LWD and comprehensive conservative PT, potentially informing clinical practice and improving patient outcomes.

Keywords: Medial Epicondylitis; Golfer's Elbow; Long-Wave Diathermy; Physical Therapy; Comparative Study; Randomized Controlled Trial; Pain; Function; Grip Strength

1. Introduction

Medial epicondylitis, commonly referred to as golfer's elbow, is a prevalent musculoskeletal condition characterized by pain and tenderness localized to the medial epicondyle of the humerus. This condition significantly impacts individuals, often resulting in functional limitations and decreased quality of life. The pain is typically exacerbated by activities involving wrist flexion and pronation, commonly seen in sports and occupational settings. Epidemiological studies have underscored the prevalence and determinants of both lateral and medial epicondylitis, highlighting the importance of understanding the underlying risk factors.[4] Occupational risk factors, such as repetitive movements and forceful exertions, have been identified as significant contributors to the development of medial epicondylitis.[5]

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The cornerstone of managing medial epicondylitis lies in conservative treatment approaches, primarily encompassing physical therapy interventions. These interventions typically include a combination of exercise therapy, manual therapy techniques, and modalities such as ultrasound. Exercise therapy aims to improve muscle strength, flexibility, and endurance, while manual therapy focuses on addressing biomechanical impairments and restoring joint mobility. Modalities like ultrasound are employed for their potential to reduce pain and promote tissue healing. However, the efficacy of these interventions can vary, and a systematic review has indicated that while exercise and mobilization techniques show promise, the evidence is not uniformly strong.[6]

In addition to traditional physical therapy modalities, long-wave diathermy (LWD) is frequently utilized for its ability to deliver deep thermal energy to tissues. This deep heating effect is thought to increase blood flow, reduce muscle spasms, and enhance tissue extensibility, potentially facilitating pain relief and promoting tissue repair. Research has explored the effectiveness of various modalities, including ultrasound, in related conditions such as lateral epicondylitis.[2][1][11] Furthermore, studies have investigated the application of LWD in other musculoskeletal conditions, demonstrating its potential to alleviate pain and improve function.[8][7][9][10] However, a direct comparative analysis of LWD versus a comprehensive conservative physical therapy program specifically for medial epicondylitis is essential to establish evidence-based guidelines for clinical practice.

Objective of the Study

The primary objective of this study is to comparatively evaluate the effects of long-wave diathermy (LWD) versus a comprehensive conservative physical therapy (PT) program on pain intensity, functional capacity, and grip strength in patients diagnosed with medial epicondylitis.

2. Materials and Methods

This literature review was conducted using a systematic approach to identify relevant studies from reputable databases, including PubMed, Google Scholar, and ResearchGate. The search strategy involved the use of keywords such as "medial epicondylitis," "golfer's elbow," "long-wave diathermy," "physical therapy," "conservative treatment," "comparative study," and "ultrasound." Inclusion criteria were established to select studies that evaluated the effectiveness of LWD or conservative physical therapy interventions in medial epicondylitis or related musculoskeletal conditions. Exclusion criteria were applied to exclude studies that did not provide relevant data or focused exclusively on surgical interventions. The selected studies were critically appraised, and data were extracted to synthesize the findings.

Table 1 Review of literature

Serial No.	Title	Methods	Study Results	Conclusion
1	Lundeberg, T., Abrahamsson, P and Haker, E (1988). 'A comparative study of continuous ultrasound, placebo ultrasound and rest in epicondylalgia'	Comparative study of continuous ultrasound, placebo ultrasound, and rest in lateral epicondylitis.	Ultrasound group demonstrated significant pain reduction compared to placebo and rest groups.	Continuous ultrasound is effective in reducing pain associated with lateral epicondylitis.
2	Binder A, Hodge G, Greenwood AM, Hazleman BL, Page Thomas DP. Is therapeutic ultrasound effective in treating soft tissue lesions?[1]	Randomized controlled trial (RCT) comparing ultrasound with placebo in patients with lateral epicondylitis.	Ultrasound group showed significantly greater improvement in pain scores, grip strength, and weight lifting ability compared to the placebo group.	Ultrasound enhances recovery in patients with lateral epicondylitis by improving pain and function.
3	Bisset L, Paungmali A, Vicenzino B, Beller E. A systematic review and meta-analysis of clinical trials on physical interventions for lateral epicondylalgia.[2]	Systematic review and meta-analysis of clinical trials evaluating physical interventions for lateral epicondylitis.	Exercise therapy and manual therapy demonstrated moderate evidence of effectiveness in reducing pain and improving function.	Exercise and manual therapy are beneficial interventions for the management of lateral epicondylitis.

4	Shiri R, Viikari-Juntura E, Varonen H, Heliövaara M. Prevalence and determinants of lateral and medial epicondylitis: a population[3] study.	Population-based study examining the prevalence and determinants of lateral and medial epicondylitis.	Identified various risk factors, including occupational exposures and individual characteristics, associated with the development of both lateral and medial epicondylitis.	Provides valuable epidemiological data on the prevalence and risk factors of epicondylitis.
5	Descatha A, Leclerc A, Chastang JF, Roquelaure Y; Study Group on Repetitive Work. Medial epicondylitis in occupational settings: prevalence, incidence and associated risk[4] factors.	Study examining the prevalence, incidence, and associated risk factors of medial epicondylitis in occupational settings.	Identified specific occupational risk factors, such as repetitive movements and forceful exertions, contributing to the development of medial epicondylitis.	Highlights the significant role of occupational factors in the etiology of medial epicondylitis.
6	Hoogvliet P, Randsdorp MS, Dingemanse R, Koes BW, Huisstede BM. Does effectiveness of exercise therapy and mobilisation techniques offer guidance for the treatment of lateral and medial epicondylitis?[5]	Systematic review of studies evaluating the effectiveness of exercise therapy and mobilization techniques for lateral and medial epicondylitis.	Exercise and mobilization techniques showed some effectiveness, but the strength of evidence varied across studies.	Provides insights into the effectiveness of specific physical therapy interventions for epicondylitis.
7	Sawant S., Rao K. "Effectiveness of myofascial release (MFR) and long wave diathermy (LWD) on upper trapezius spasm".	Experimental study investigating the combined effects of myofascial release and long-wave diathermy on upper trapezius muscle spasm.	The combined application of MFR and LWD resulted in significant reductions in pain levels.	LWD, when combined with MFR, is effective in reducing muscle spasm and associated pain.
8	Visconti L, Forni C, Coser R, Trucco M, Magnano E, Capra G. Comparison of the effectiveness of manual massage, long-wave diathermy, and sham long-wave diathermy for the management[6] of delayed-onset muscle soreness: a randomized controlled trial.[7]	RCT comparing the effectiveness of manual massage, long-wave diathermy, and sham long-wave diathermy for delayed-onset muscle soreness.	Both manual massage and LWD demonstrated significant pain reduction compared to sham LWD.	LWD is effective in reducing delayed-onset muscle soreness.
9	Usha P, Kusum S, Shabnam J, Alka P. A randomized controlled trial on the efficacy of longwave diathermy on pain, disability and range of motion in the patients with neck[8] pain	RCT examining the efficacy of long-wave diathermy on pain, disability, and range of motion in patients with neck pain.	The LWD group showed significant improvements in pain, disability, and range of motion compared to the control group.	LWD is effective in alleviating pain and improving function in patients with neck pain.
10	Gokulakrishnan J, Ramasamy R. Impact of long wave diathermy and DAPRE technique intervention on hamstring injury: A single case study	Single case study investigating the combined effects of long-wave diathermy and DAPRE technique on hamstring injury.	The combined intervention resulted in significant improvement in pain and function, enabling the athlete to return to sport.	LWD, in conjunction with DAPRE, is effective in promoting recovery from hamstring injuries.

11	Maxwell L. Therapeutic ultrasound: Its effects on the cellular and molecular mechanisms of inflammation and repair.	Review of ultrasound's effects on cellular and molecular mechanisms of inflammation and repair.	Provides information about the mechanisms of therapeutic ultrasound.	Provides insight into the physiological effects of therapeutic ultrasound.

3. Discussion

The management of medial epicondylitis necessitates a comprehensive and evidence-based approach, combining various therapeutic modalities and interventions. This detailed treatment protocol aims to provide clinicians with specific parameters, rationales, and considerations for the application of ultrasound, long-wave diathermy (LWD), exercise therapy, and manual therapy. By outlining precise treatment strategies, patient selection criteria, and comparative effectiveness considerations, this discussion seeks to enhance clinical decision-making and optimize patient outcomes in the management of medial epicondylitis.

3.1. Efficacy of Modalities in Musculoskeletal Conditions

- **Ultrasound**
  - Studies like Binder et al. (1985) and Lundeberg et al. (1988) demonstrate ultrasound's efficacy in lateral epicondylitis, suggesting its potential for medial epicondylitis.
  - Parameters: Pulsed or continuous ultrasound at 1-3 MHz, 0.5-1.5 W/cm^2, 5-10 minutes per session, 2-3 times per week.
  - Rationale: Reduces pain, inflammation, and promotes tissue healing through thermal and non-thermal effects.
- **Long-Wave Diathermy (LWD)**
  - Visconti et al. (2020), Sawant & Rao (2019), and other studies show LWD's benefits in musculoskeletal pain.
  - Parameters: Frequency 0.3-1 MHz, 15-30 minutes per session, 2-3 times per week, dosage adjusted based on patient tolerance.
  - Rationale: Increases deep tissue temperature, enhancing blood flow, reducing muscle spasm, and improving tissue extensibility.

3.2. Role of Exercise and Manual Therapy

- **Exercise Therapy**
  - Specific exercises: Wrist flexion/extension, pronation/supination, and grip strengthening.
  - Progression: Isometric, concentric, and eccentric exercises, gradually increasing resistance and repetitions.
  - Frequency: Daily or 2-3 times per week, depending on patient tolerance.
  - Rationale: Strengthens affected muscles, improves flexibility, and enhances functional capacity.
- **Manual Therapy**
  - Techniques: Soft tissue mobilization, joint mobilization (if indicated), and neural mobilization.
  - Focus: Addressing muscle tightness, joint restrictions, and neural tension.
  - Frequency: 1-2 times per week, depending on patient response.
  - Rationale: Restores normal joint mechanics, reduces muscle tension, and improves pain-free movement.

3.3. Potential of Long-Wave Diathermy (LWD)

- **Targeted Application**
  - Focus LWD application on the medial epicondyle and surrounding muscle bellies.
  - Monitor skin temperature to prevent burns.
  - Combine with stretching post LWD treatment to increase muscle extensibility.
- **Patient Selection**
  - Consider LWD for patients with chronic pain, significant muscle spasm, or limited response to other modalities.
  - Contraindications: Metal implants, pacemakers, pregnancy, and acute inflammation.

3.4. Comparative Effectiveness: LWD vs. Comprehensive Conservative Physical Therapy

- **Study Design**
  - Randomized controlled trials (RCTs) are essential for comparing LWD with a comprehensive PT program.
  - Control group: Standardized PT program (exercise, manual therapy, and ultrasound/placebo).
  - Experimental group: LWD combined with a modified PT program (if necessary).
- **Outcome Measures**
  - Pain scales (VAS, NPRS), grip strength (dynamometer), functional assessments (DASH, PRTEE), and patient-reported outcomes (PROs).
  - Long-term follow-up: Assess sustainability of treatment effects at 3, 6, and 12 months.

3.5. Future Research Directions

- **Dosage Optimization**
  - Investigate optimal LWD parameters (frequency, intensity, and duration) for medial epicondylitis.
  - Explore the synergistic effects of combining LWD with specific exercises and manual therapy techniques.
- **Subgroup Analysis**
  - Identify patient subgroups that may benefit most from LWD or comprehensive PT.
  - Consider factors such as chronicity, severity, and comorbidities.

3.6. Mechanisms of Action and Physiological Effects

- **LWD Effects**
  - Increased blood flow: Enhanced delivery of oxygen and nutrients to tissues.
  - Muscle relaxation: Reduced muscle spasm and tension.
  - Increased tissue extensibility: Improved flexibility and range of motion.
- **PT Effects**
  - Strengthening: Improved muscle function and stability.
  - Joint mobilization: Restored normal joint mechanics and reduced pain.
  - Neural mobilization: Reduced neural tension and improved nerve function.

3.7. Clinical Implications and Treatment Protocol Considerations

- **Initial Assessment**
  - Detailed history, physical examination, and functional assessment.
  - Identify contributing factors: Occupational, recreational, and biomechanical.
- **Treatment Protocol**
  - Phase 1 (Acute): Pan management (ultrasound, LWD), gentle ROM exercises, and activity modification.
  - Phase 2 (Subacute): Progressive strengthening exercises, manual therapy, and gradual return to activities.
  - Phase 3 (Chronic): Advanced strengthening, functional training, and prevention strategies.
- **Patient Education**
  - Ergonomic principles, activity modification, and self-management strategies.
  - Home exercise program: Reinforce exercises and promote adherence.
- **Monitoring and Progression**
  - Regular assessment of pain, function, and progress.
  - Adjust treatment parameters based on patient response.
  - Documentation of all procedures and patient progression.
- **Interdisciplinary Approach**
  - If needed, collaborate with other healthcare professionals (e.g., orthopedic surgeons, pain specialists).

4. Conclusion

In conclusion, while long-wave diathermy has demonstrated promise in various musculoskeletal conditions, its comparative effectiveness to a comprehensive conservative physical therapy program in the specific context of medial epicondylitis remains unclear. The existing literature highlights the individual benefits of ultrasound, exercise, and manual therapy, as well as the potential of LWD in other musculoskeletal conditions. However, a direct comparative study is necessary to provide evidence-based recommendations for the optimal management of medial epicondylitis.

Future randomized controlled trials should be conducted to compare LWD with standardized physical therapy protocols, utilizing objective outcome measures and considering long-term follow-up. These studies will help clinicians make informed decisions regarding the use of LWD and conservative physical therapy interventions in patients with medial epicondylitis, ultimately improving patient outcomes and quality of life. By addressing the current gaps in the literature, clinicians can optimize treatment strategies and provide more effective care for individuals suffering from this common and debilitating condition.

Recommendation

Based on the existing literature and the identified gap in directly comparing long-wave diathermy (LWD) with a comprehensive conservative physical therapy (PT) program for medial epicondylitis, it is strongly recommended that a well-designed, randomized controlled trial (RCT) be conducted to address this clinical question by enrolling a homogenous sample, randomly allocating participants to standardized LWD or comprehensive PT groups, utilizing a multi-faceted assessment approach with pain intensity, functional capacity, and grip strength as primary outcomes and patient-reported global improvement, quality of life, and range of motion as secondary outcomes, implementing standardized treatment protocols with fidelity monitoring, conducting assessments at baseline, during, end of treatment, and at follow-up intervals, employing appropriate statistical methods, and reporting findings transparently to provide evidence-based guidance for optimal management and improved patient outcomes.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Lundeberg, T., Abrahamsson, P and Haker, E (1988). 'A comparative study of continuous ultrasound, placebo ultrasound and rest in epicondylalgia', Scandinavian Journal of Rehabilitation Medicine, 20 99-101.

[2] Binder A, Hodge G, Greenwood AM, Hazleman BL, Page Thomas DP. Is therapeutic ultrasound effective in treating soft tissue lesions? Br Med J (Clin Res Ed). 1985 Feb 16;290(6467):512-4. doi: 10.1136/bmj.290.6467.512. PMID: 3918652; PMCID: PMC1418052.

[3] Bisset L, Paungmali A, Vicenzino B, Beller E. A systematic review and meta-analysis of clinical trials on physical interventions for lateral epicondylalgia. Br J Sports Med. 2005 Jul;39(7):411-22; discussion 411-22. doi: 10.1136/bjsm.2004.016170. PMID: 15976161; PMCID: PMC1725258.

[4] Shiri R, Viikari-Juntura E, Varonen H, Heliövaara M. Prevalence and determinants of lateral and medial epicondylitis: a population study. Am J Epidemiol. 2006 Dec 1;164(11):1065-74. doi: 10.1093/aje/kwj325. Epub 2006 Sep 12. PMID: 16968862.

[5] Descatha A, Leclerc A, Chastang JF, Roquelaure Y; Study Group on Repetitive Work. Medial epicondylitis in occupational settings: prevalence, incidence and associated risk factors. J Occup Environ Med. 2003 Sep;45(9):993-1001. doi: 10.1097/01.jom.0000085888.37273.d9. PMID: 14506342; PMCID: PMC4850209.

[6] Hoogvliet P, Randsdorp MS, Dingemanse R, Koes BW, Huisstede BM. Does effectiveness of exercise therapy and mobilisation techniques offer guidance for the treatment of lateral and medial epicondylitis? A systematic review. Br J Sports Med. 2013 Nov;47(17):1112-9. doi: 10.1136/bjsports-2012-091990. Epub 2013 May 24. PMID: 23709519.

[7] Sawant S., Rao K. "Effectiveness of myofascial release (MFR) and long wave diathermy (LWD) on upper trapezius spasm". International Journal of Multidisciplinary Research and Development, Volume 6, Issue 3, 2019, Pages 159-162

[8] Visconti L, Forni C, Coser R, Trucco M, Magnano E, Capra G. Comparison of the effectiveness of manual massage, long-wave diathermy, and sham long-wave diathermy for the management of delayed-onset muscle soreness: a randomized controlled trial. Arch Physiother. 2020 Jan 15;10:1. doi: 10.1186/s40945-019-0073-4. PMID: 31956433; PMCID: PMC6961300.

[9] A randomized controlled trial on the efficacy of longwave diathermy on pain, disability and range of motion in the patients with neck pain December 2022Revista Pesquisa em Fisioterapia 12:e4805 DOI:10.17267/2238-2704rpf.2022.e4805 LicenseCC BY 4.0

[10] Impact of long wave diathermy and DAPRE technique intervention on hamstring injury: A single case study January 2024International Journal of Physical Education Sports and Health 11(1):176-177 DOI:10.22271/kheljournal.2024.v11.i1c.3220

[11] Maxwell L. Therapeutic ultrasound: Its effects on the cellular and molecular mechanisms of inflammation and repair. Physiotherapy 1992;78:421-6