



International Journal of Physiotherapy Research and Clinical Practice

Original Article

Comparative Analysis of Ultrasound Therapy versus Extracorporeal Shock Wave Therapy for the Management of Tennis Elbow

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ARTICLE INFO

Article history:

Received 16.02.2024

Accepted 04.05.2024

Published 14.05.2024

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[https://doi.org/](https://doi.org/10.54839/ijprcp.v3i1.24.8)

[10.54839/ijprcp.v3i1.24.8](https://doi.org/10.54839/ijprcp.v3i1.24.8)

ABSTRACT

This study aims to conduct a comparative analysis of the therapeutic efficacy between ultrasound therapy and extracorporeal shock wave therapy in the management of tennis elbow. Thirty adult subjects diagnosed with tennis elbow were prospectively enrolled in this study and stratified into two groups: Group A (undergoing extracorporeal shock wave therapy) and Group B (undergoing ultrasound therapy). Pain intensity was quantified using the Visual Analogue Scale (VAS), functional impairment was assessed through the Patient-Rated Tennis Elbow Evaluation (PRTEE), and hand grip strength was measured via dynamometry. Pre-treatment and post-treatment assessments were performed to evaluate the therapeutic outcomes. Both extracorporeal shock wave therapy and ultrasound therapy demonstrated efficacy in alleviating pain and improving functional capacity in individuals afflicted with tennis elbow. Notably, Group A exhibited a statistically significant reduction in pain intensity, as evidenced by decreased VAS scores, alongside a marked enhancement in grip strength post-treatment, in contrast to Group B. Ultrasound therapy yielded comparatively modest improvements in pain relief and failed to elicit significant enhancement in grip strength. The findings of this investigation underscore the superior therapeutic efficacy of extracorporeal shock wave therapy over ultrasound therapy in the management of tennis elbow. Extracorporeal shock wave therapy conferred substantial amelioration in pain intensity and functional impairment, thereby emphasizing its preferential utilization as a therapeutic modality for tennis elbow.

Keywords: Tennis elbow; Lateral epicondylitis; Musculoskeletal disorder; Physical therapy; Pain management

1 INTRODUCTION

Tennis elbow, clinically referred to as lateral epicondylitis, represents a prevalent musculoskeletal pathology characterized by localized pain and tenderness at the lateral aspect of the elbow joint¹. Etiologically attributed to repetitive overuse and microtrauma, this condition commonly afflicts individuals engaged in activities necessitating repetitive wrist extension and forearm pronation, such as racquet sports and manual labor². Therapeutic interventions for tennis elbow encompass an array of modalities, encompassing rest, pharmacotherapy, physical therapy, and interventional procedures. Among these modalities, ultrasound therapy and extracorporeal shock wave therapy have garnered substantial attention due to their purported efficacy in pain alleviation and tissue healing^{1,3}.

Ultrasound therapy entails the application of high-frequency sound waves to the affected region, eliciting

thermal and non-thermal effects conducive to tissue repair and analgesia⁴. Conversely, extracorporeal shock wave therapy entails the targeted delivery of high-energy shock waves to the afflicted area, stimulating neovascularization, modulating inflammatory cascades, and promoting tissue regeneration⁵.

Despite the widespread adoption of these therapeutic modalities, a paucity of comparative studies evaluating their relative efficacy in the management of tennis elbow exists. Thus, this study endeavors to elucidate the therapeutic superiority between ultrasound therapy and extracorporeal shock wave therapy in ameliorating pain intensity and functional impairment associated with tennis elbow⁶.

2 MATERIALS AND METHODS

- **Participant Selection:** A cohort of thirty adult individuals diagnosed with tennis elbow was recruited

for this prospective study, following ethical approval and informed consent. The participants were randomly allocated into two groups: Group A (undergoing extracorporeal shock wave therapy) and Group B (undergoing ultrasound therapy).

- **Treatment Protocol:** Group A subjects received a course of extracorporeal shock wave therapy, while Group B subjects underwent ultrasound therapy sessions, adhering to standardized treatment protocols.
- **Outcome Measures:** Pain intensity was quantified utilizing the Visual Analogue Scale (VAS), functional impairment was assessed employing the Patient-Rated Tennis Elbow Evaluation (PRTEE), and hand grip strength was measured utilizing dynamometry. Pre-treatment and post-treatment assessments were conducted to evaluate therapeutic efficacy.
- **Statistical Analysis:** The pre-treatment and post-treatment outcome measures were subjected to statistical analysis employing appropriate parametric or non-parametric tests, as deemed applicable.

3 RESULTS

Both extracorporeal shock wave therapy and ultrasound therapy conferred therapeutic benefits in ameliorating pain intensity and enhancing functional capacity in individuals afflicted with tennis elbow. However, Group A subjects, receiving extracorporeal shock wave therapy, exhibited a statistically significant reduction in pain intensity, as evidenced by a pronounced decrease in VAS scores. Moreover, Group A demonstrated a marked improvement in grip strength following the treatment regimen. In contrast, Group B subjects, undergoing ultrasound therapy, manifested comparatively modest improvements in pain relief and failed to exhibit a significant enhancement in grip strength post-treatment. Data from both the groups are displayed in Figures 1, 2 and 3.

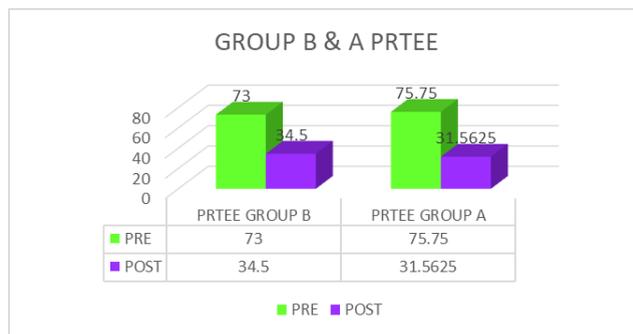


Fig. 2: PRTEE score comparison pre and post-among the groups

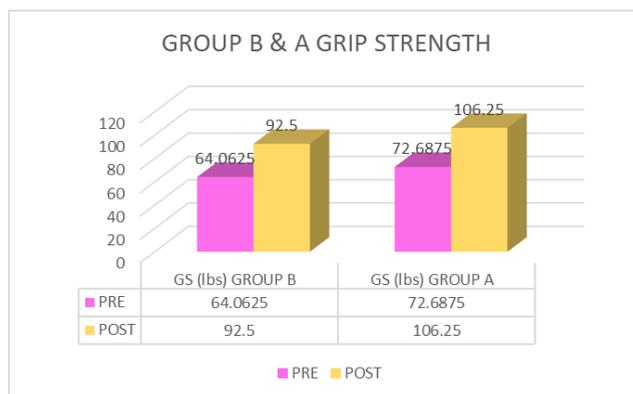


Fig. 3: Grip strength comparison pre-post among the groups

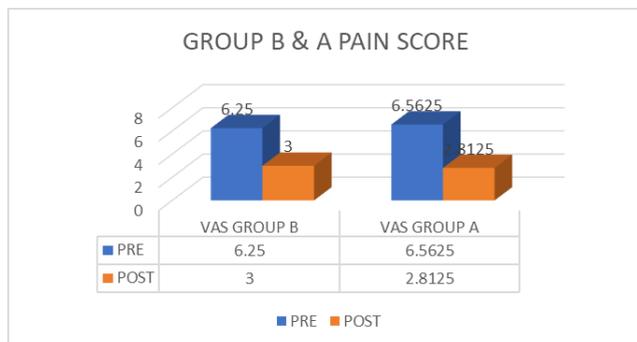


Fig. 1: Pain score comparison pre and post-among the groups

4 CONCLUSION

This study elucidates the superior therapeutic efficacy of extracorporeal shock wave therapy over ultrasound therapy in the management of tennis elbow. Extracorporeal shock wave therapy engendered substantial alleviation in pain intensity and functional impairment, thereby underscoring its preferential utilization as a therapeutic modality for tennis elbow. These findings underscore the imperative for judicious selection of therapeutic interventions to optimize clinical outcomes in individuals afflicted with tennis elbow.

5 DISCUSSION

The observed disparity in treatment outcomes between ESWT and ultrasound therapy underscores the divergent mechanisms of action inherent to these modalities. ESWT functions through the application of high-energy shock waves to induce tissue regeneration and mitigate inflammatory processes, whereas ultrasound therapy relies on the transmission of high-frequency sound waves to enhance tissue healing and reduce inflammation⁷. The superior efficacy of ESWT in pain reduction and grip strength enhancement may be attributed to its deeper tissue penetration and more pronounced biological effects compared to ultrasound therapy. Furthermore, the negligible improvement in grip

strength following ultrasound therapy suggests its limited capacity to address underlying musculoskeletal deficits associated with tennis elbow⁸. These findings underscore the importance of selecting appropriate therapeutic modalities tailored to the specific pathophysiological mechanisms underlying tennis elbow for optimal treatment outcomes⁹.

REFERENCES

1. Rashid HK, Samanta D, George SS, Cardoza VJ, Ali Z. Current Physical Therapies Available for the Rehabilitation of Tennis Elbow: A Review Article. *International Journal of Physiotherapy Research and Clinical Practice*. 2022;1(1):26–32. Available from: <https://dx.doi.org/10.54839/ijprcp.v1i1.22.5>.
2. Gallagher S, Barbe MF. *Musculoskeletal Disorders: The Fatigue Failure Mechanism*. John Wiley & Sons. 2022.
3. Bashir M, Khanday ZM, Mir MF, Bhat WA, Javid SV, Alkahtani S, et al. Comparing the efficacy of blind vs. ultrasound-guided injections in Lateral Epicondylitis: A prospective analysis. *Journal of King Saud University - Science*. 2024;36(1). Available from: <https://dx.doi.org/10.1016/j.jksus.2023.103026>.
4. Gavrilov LR. Use of focused ultrasound for stimulation of nerve structures. *Ultrasonics*. 1984;22(3):132–138. Available from: [https://dx.doi.org/10.1016/0041-624x\(84\)90008-8](https://dx.doi.org/10.1016/0041-624x(84)90008-8).
5. Loske AM, Loske AM. Extracorporeal Shock Wave Therapy. *Medical and Biomedical Applications of Shock Waves*. 2017;p. 189–250.
6. Filippo LD, Vincenzi S, Pennella D, Maselli F. Treatment, Diagnostic Criteria and Variability of Terminology for Lateral Elbow Pain: Findings from an Overview of Systematic Reviews. *Healthcare*. 2022;10(6). Available from: <https://dx.doi.org/10.3390/healthcare10061095>.
7. Blei F. Update October 2020. *Lymphatic Research and Biology*. 2020;18:474–498. Available from: <https://dx.doi.org/10.1089/lrb.2020.29092.fb>.
8. Tonks JH. Evaluation of short-term conservative treatment in patients with tennis elbow (lateral epicondylitis): A prospective randomised, assessor-blinded trial . .
9. Pathan AF, Sharath HV. A Review of Physiotherapy Techniques Used in the Treatment of Tennis Elbow. *Cureus*. 2023;15(10). Available from: <https://dx.doi.org/10.7759/cureus.47706>.