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TECAR therapy as an emerging treatment for coccydynia

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Abstract

Background: TECAR (Transfer Energy Capacitive and Resistive) therapy, a novel deep thermal modality, boasts unique characteristics that enable it to target various tissues, from muscles to joint capsules, without the limitations of similar modalities like Ultrasound (US) and Shortwave Diathermy (SWD). Coccydynia, a condition characterized by pain in the coccygeal region, often results from sudden impact or traumatic injuries, leading to pain and inflammation in surrounding ligaments and muscles.

Objective: This study aimed to assess the efficacy of TECAR therapy in managing Coccydynia.

Methodology: A total of 30 patients (mean age: 40 years, range: 30-50; 10 males, 20 females) with a mean pain duration of 2-6 months participated in the study. The treatment protocol consisted of 12 TECAR therapy sessions over 3 consecutive weeks (4 days/week), with a frequency of 500 Hz and intensity of 30-50%.

Results: The study revealed significant changes in Visual Analog Scale (VAS) scores, indicating substantial pain relief and functional improvement.

Conclusion: TECAR therapy demonstrates potential as an effective, non-invasive treatment option for Coccydynia patients, offering a valuable alternative for managing this condition.

Keywords: TECAR therapy, coccydynia, pelvic floor disorder

Introduction

TECAR therapy offers two distinct treatment options, utilizing either capacitive or resistive electrodes to target various tissues. The capacitive electrode focuses heat on high-electrolyte tissues like muscles, while the resistive electrode generates heat in higher-resistance tissues, such as tendons and joint capsules. This therapy boasts unique features, including the ability to apply minimal to no thermal effects in acute and subacute conditions, as well as the capacity to combine with manual techniques and exercises for enhanced results^[5, 6, 7].

Unlike other deep thermal modalities like Shortwave Diathermy (SWD) and Ultrasound (US), TECAR therapy operates at a distinct frequency. Ultrasound devices emit 1- to 3-MHz frequencies, causing molecular circular motion, while SWD machines operate at 8- to 14-MHz frequencies, producing external heat. TECAR's capacitive mode can be used near metal prostheses without restrictions, allowing for personalized power and energy adjustments based on patient feedback^[8, 9, 10].

Recent research has demonstrated TECAR therapy's efficacy in improving pain, disabilities, and quality of life for patients with musculoskeletal disorders, making it a valuable treatment option in physiotherapy.

Coccydynia refers to pain and discomfort in the coccygeal region, often resulting from sudden trauma or falls that impact the coccyx area. This type of injury can lead to inflammation and strain on the surrounding ligaments and muscles, causing persistent pain. In some cases, coccydynia^[11, 12, 13].

Objective of the study

This research investigation seeks to assess the therapeutic efficacy of TECAR therapy in individuals diagnosed with coccydynia, with the goal of determining its potential as a viable treatment option for managing this condition.

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Methodology

A retrospective study was conducted to assess the effectiveness of Tecar therapy in patients with chronic coccydynia. The study included 30 patients, with a mean age of 40 years (range 30-50), comprising 10 men and 20 women. The patients had experienced persistent pain for an average duration of 2-6 months.

To be eligible for the study, patients had to meet specific criteria, including:

1. A Visual Analog Scale (VAS) score of 4 or higher in at least one of the following positions: sitting, standing, or supine, for a minimum of 2 months
2. No prior coccygeal injections or manipulations within the last 2 months
3. No underlying systemic diseases, such as uncontrolled diabetes or rheumatoid arthritis
4. No history of malignancy or coccygeal dislocation
5. No skin issues at the treatment site
6. No concurrent biofeedback therapy for other pelvic floor disorders

Conversely, patients were excluded from the study if they had

1. Received injections in the last 3 months (Including corticosteroids, autologous blood, platelet-rich plasma, mesotherapy, or dry needling neural therapy)
2. Were pregnant
3. Had severe coagulopathy
4. Suffered from chronic pain conditions like fibromyalgia or polymyalgia rheumatica
5. Experienced a fracture or severe trauma
6. Were lost to follow-up

By evaluating the medical records of these patients, the study aimed to determine the efficacy of Tecar therapy in alleviating chronic Coccydynia symptoms [14, 15, 16].

Prior to initiating treatment, patients self-reported their pain intensity using a Visual Analog Scale (VAS), with scores ranging from 0 (no pain) to 10 (worst possible pain). To assess treatment efficacy, VAS scores were reassessed at three key time points: immediately following treatment completion and during follow-up sessions at 1st and 12th weeks post-treatment.

The treatment protocol consisted of 12 TECAR therapy sessions, administered over a period of 3 consecutive weeks, with a frequency of 4 days per week. The TECAR therapy was applied at a frequency of 500 Hz and an intensity of 30-50%, tailored to individual patient needs. By using this standardized protocol and assessment framework, the study aimed to objectively evaluate the impact of TECAR therapy on chronic Coccydynia pain management and patient outcomes.

Results

VAS showed significant differences before and after the study. From a clinical perspective (Pain relief and functional improvement), the TECAR therapy group showed more definite changes. (Figure 1 and table 1).

Table 1: VAS score post TECAR

Time	Vas (Mean value)	P Value
0 Day	6	p < 0.001
6 TH Week	4	
12 TH Week	3	

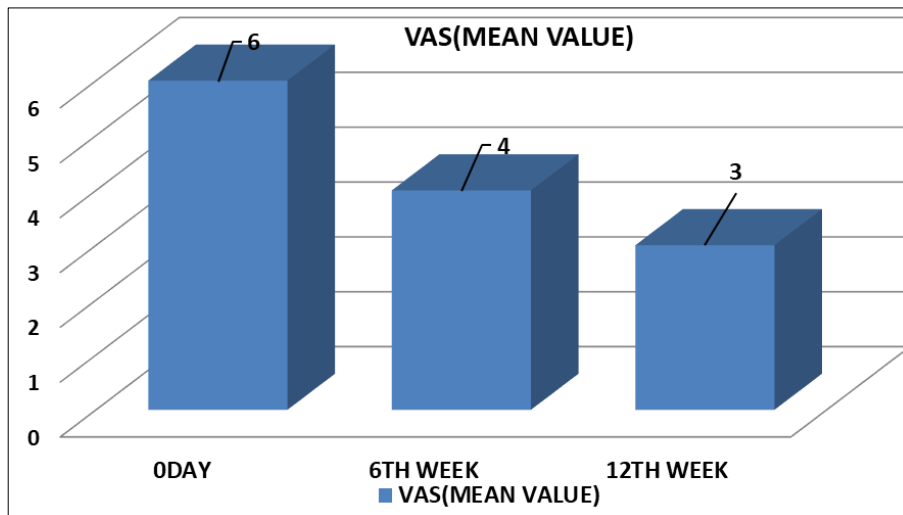


Fig 1: VAS score post TECAR

In this study, we assessed the impact of TECAR therapy on clinical symptoms in patients with mild to moderate coccydynia. In our study, VAS and Boston Questionnaire variables showed a good response. However, we can justify the VAS and Boston Questionnaire variables by examining the research and article review mechanism.

Discussion

This study investigated the efficacy of TECAR therapy in alleviating clinical symptoms in patients with mild to moderate Coccydynia. Our findings revealed significant improvements in both Visual Analog Scale (VAS) and

Boston Questionnaire variables, indicating a positive response to treatment.

The effectiveness of TECAR therapy can be attributed to its distinct characteristics as a deep thermal modality. Unlike other similar modalities like Ultrasound (US) and Shortwave Diathermy (SWD), TECAR therapy can target a range of tissues, from muscles to joint capsules, without limitations. Previous research has demonstrated that TECAR therapy enhances muscle flexibility and tendon blood circulation, making it a valuable treatment option for managing musculoskeletal disorders.

Our study's results align with existing literature, highlighting the potential of TECAR therapy in improving symptoms and quality of life for patients with Coccydynia. By examining the research and article review mechanism, we can further justify the positive outcomes observed in our study, underscoring the therapeutic benefits of TECAR therapy in this patient population [16, 17, 18].

This study pioneers the investigation of TECAR therapy's impact on coccydynia, filling a significant knowledge gap in the field. The findings of this research are expected to provide invaluable insights, enabling physiotherapists to make informed decisions when selecting the most effective treatment approaches for managing this condition. This, in turn, has the potential to enhance patients' quality of life and care.

Due to the limited existing research on TECAR therapy, particularly in the context of coccydynia, this study's results can be compared to other investigations that have evaluated the effectiveness of TECAR therapy in various diseases and disabilities. Furthermore, this research contributes to the growing body of literature on TECAR therapy, a novel deep heat physical modality, as a potential treatment for peripheral entrapment neuropathies and neuropathic pain.

By exploring the efficacy of TECAR therapy in managing coccydynia, this study lays the groundwork for future research and provides a foundation for comparing its findings with other studies that have investigated TECAR therapy's applications in different clinical contexts.

The exact mechanism of action of TECAR therapy remains unclear, but research has confirmed its beneficial effects, including reduced muscle spasms, enhanced oxygenation, improved metabolic status, and decreased pain. By delivering radiofrequency energy to tissues, TECAR therapy relaxes muscles and ligaments, promoting nervous system repair. In this study, pain, the primary complaint of coccydynia patients, was assessed using the Visual Analog Scale (VAS). The observed reductions in VAS scores and patient pain levels can be attributed to the Gate theory processes, which explain how TECAR therapy modulates pain perception.

TECAR therapy's effects can be compared to other deep heat modalities, such as therapeutic ultrasound. Studies have shown that ultrasound therapy improves clinical symptoms and nerve conduction parameters in patients with mild to moderate carpal tunnel syndrome, with sustained benefits observed at six-month follow-up. While some research has reported no short-term benefits of ultrasound, long-term effects have been noted. Similarly, TECAR therapy's unique mechanism of action may offer distinct advantages in managing coccydynia and other musculoskeletal conditions [19, 20].

Conclusion

This study's findings offer valuable insights into the efficacy of TECAR therapy for coccydynia, a condition with limited research on this treatment approach. The results provide foundational knowledge on the effectiveness of TECAR therapy, potentially informing the development of optimized treatment protocols. Notably, TECAR therapy emerges as a promising non-invasive treatment option for coccydynia patients, offering a valuable alternative to more invasive or pharmacological interventions. By exploring TECAR therapy's potential in managing coccydynia, this study contributes to the expansion of evidence-based

treatment options for this condition, ultimately enhancing patient care and outcomes.

Conflict of Interest

Not available.

Financial Support

Not available.

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