

NEW ADVANCEMENT IN PHYSICAL AGENT MODALITIES IN SPORT INJURY MANAGEMENT

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Introduction: From a rehabilitation perspective, various approaches and strategies might be applied to help athletes overcome injury, including physical agent modalities (PAMs) with conventional physical therapy in the management of muscle recovery facilitating effective coordination in the healing process, providing advantages across different types of muscle injuries. Nevertheless, despite their widespread practice, there is a lack of solid bibliographic evidence to conclusively confirm their efficacy.

Therefore, this systematic review aimed to analyze the existing evidence regarding the clinical effectiveness of PAMs in pain management of sports-related injuries of athletes. Methods: PubMed, Scopus, and Web of Science were systematically searched from inception until May 8th, 2024. The papers were considered eligible for review in compliance with the conditions determined by the following PICO model: P) Participants: injured athletes; I) Intervention: magnetic therapy, TENS, lasertherapy, ultrasound therapy, diathermy, and extracorporeal shockwave therapy (ESWT); C) Comparator: NA; O) Outcome measure: any pain assessment. Results: Study selection reported a total of 785 records. After eliminating duplicates, we screened 484 articles. A thorough review of titles and abstracts led to the exclusion of 433 papers, leaving 51 articles for detailed eligibility assessment. Ultimately, 21 studies met our inclusion criteria, involving a total of 806 participants. These studies explored a variety of therapeutic PAMs for musculoskeletal conditions. Ten studies investigated ESWT, a non-invasive, safe, and highly effective treatment for various musculoskeletal issues, particularly when conventional methods prove insufficient; thus, conditions effectively treated include calcific tendinopathy of the shoulder, lateral epicondylitis, greater trochanteric pain syndrome, plantar fasciitis, and delayed bone healing. (1) Qu et al. (2) compared cold-water immersion, contrast-water therapy, and whole-body cryotherapy for post-exercise muscle damage in runners; in this, scenario whole-body cryotherapy emerged, as the most effective method for reducing muscle soreness.

Additionally, a pilot randomized controlled trial explored the combined use of cryotherapy and ultrasound alongside standard care to accelerate recovery from ankle sprains in football players. (3) Two randomized controlled trials (RCTs) demonstrated diathermy's superiority over ultrasound therapy in alleviating pain and improving patient satisfaction among athletes with chronic tendinopathies. (4) Regarding Neuromuscular Electrical Stimulation (NMES), Basas et al. (5) founded that combining NMES with eccentric and concentric exercises significantly reduced pain in athletes with patellar tendinopathy, with benefits sustained during long-term follow-up. Moreover, Transcutaneous Electrical Nerve Stimulation (TENS) applied directly to the painful area resulted in notable reductions in pain intensity during and immediately after treatment. Lastly, emerging

evidence suggested laser therapy's effectiveness in managing acute pain and its potential as an adjunct therapy alongside physical therapy, improving performance and facilitating faster return to sport (RTS). (6) Conclusion: Taken together, the findings of this systematic review suggested that physical agents might be effective for pain management in sport-related injuries of athletes. Among the various PAMs analyzed, this systematic review highlights the role of ESWT in the treatment of subacute or chronic injuries in athletes, such as tendinopathies. On the other side, Cryoultrasound, HILT, and Diathermy might be used for the treatment of acute phase of injuries, such as muscle injuries or ankle sprain.

References

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