

عنوان مقاله:

The Beneficial Effects of High-Intensity Laser Therapy and Co-Interventions on Musculoskeletal Pain Management: A Systematic Review

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نویسندگان:

Kamran Ezzati

E-Liisa Laakso

Amir Salari

Anahita Hasannejad

Reza Fekrazad

Arash Aris

خلاصه مقاله:

**Abstract Introduction:** High-intensity laser therapy (HILT) has been used more recently in the therapeutic protocols of pain managements. Adding therapeutic interventions to laser therapy is usual in clinical practice. This study aimed to evaluate the efficacy of HILT and beneficial effects of adding co-interventions to HILT in musculoskeletal pain management. **Methods:** The following databases were searched up to August ۲۰۱۸: Medline, PubMed, EMBASE, Cochrane, Google Scholar, Springer and ISI. The keywords of pain, HILT, high power laser therapy, laser therapy, photobiomodulation, physical therapy and rehabilitation were searched. The quality of the articles was assessed using the PEDro scale. The primary measure was pain severity expected to be reported in all studies. Effect size was calculated as standardized mean differences divided by the standard deviation of either the treatment or other group. **Results:** Initially ۵۲ potential studies were found. Eighteen of these studies were excluded based on title and abstract. The full text of ۳۴ remaining articles was screened and ۱۵ of the studies were excluded. All included studies had high quality (PEDro  $\geq 7$ ). Approximately, ۹۴% of included articles (n=۱۸) revealed positive effects of HILT on pain. The effect sizes for HILT and placebo/comparator groups were ۰.۹-۹.۱۱ and ۰.۲۱-۱۱.۲۲ respectively. Also, the differences of effect size between two groups were between ۰.۰۳ to ۵.۸۵. **Conclusion:** It is early to determine that HILT may be an effective non-invasive agent in the management of musculoskeletal pain, as few studies have shown its clinical efficacy. Adding related co-interventions to HILT may enhance the beneficial effects of laser therapy. The variability of the study methods and outcomes suggests that further long-term follow-up, randomized controlled clinical trials with appropriate methodological design are needed regarding the effectiveness of HILT on pain. **Keywords:** Musculoskeletal pain Laser therapy Rehabilitation Intervention

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