

Non-LASER phototherapy in the treatment of lower extremity injuries: A critically appraised topic.

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Focused Clinical Question: In physically active individuals who suffered a lower extremity injury (P) is non-LASER phototherapy (I) compared to traditional or placebo therapy (C) more effective for reducing pain and improving function (O)?

Data Sources: We searched PubMed for relevant studies using the search terms and phrases: phototherapy, biopton, injury, musculoskeletal, and NOT LASER. MeSH subject headings included: musculoskeletal system, wounds and injuries. Search Limits: Humans and English.

Study Selection: To be included, relevant studies had to be prospective clinical trials in which patients who had suffered a lower extremity musculoskeletal injury were treated with non-LASER phototherapy with the goal of reducing pain and improving patient- and clinician-oriented outcomes. Studies must have also included a comparison/control group that received an alternative or placebo treatment.

Data Extraction: Patient-oriented outcomes included pain reduction through a visual analog scale (VAS) and perceived functional ability with the Lower Extremity Functional Scale (LEFS). Clinician-oriented outcomes included edema girth and dorsiflexion range of motion measurements.

Summary Measures: To examine the effect of phototherapy on patient- and clinician-oriented outcome measures, Hedges' g effect sizes (ES) were calculated for the post-intervention differences between the intervention and comparison groups. The precision of the point estimates was evaluated with 95% confidence intervals [CI] around the ES.

Evidence Appraisal: The PEDro scale was used to appraise the quality of the evidence of the included studies.

Search Results: Using the search terms and inclusion criteria specified above, two studies were included out of 24 identified. The first study examined the effects of 5 non-LASER phototherapy treatments combined with cryotherapy on patients with acute lateral ankle sprain (LAS). The comparison was 5 treatments of cryotherapy alone. In the second study, the effects of 3 weekly treatments of non-LASER phototherapy were compared to a placebo treatment on patients with chronic Achilles tendinopathy (CAT) at 6 and 12 weeks post-treatment.

Data Synthesis: Significant differences ($p < 0.05$) for any patient- or clinician-oriented measures were extracted and evaluated using ES[CI]. For the LAS protocol, the use of non-LASER phototherapy combined with cryotherapy resulted in substantial improvements in pain (ES:2.28[1.54-2.96], $p < 0.01$), edema reduction (ES:2.09[1.42-2.77], $p < 0.01$), and dorsiflexion range of motion (ES:1.71[1.06-2.36], $p < 0.01$) compared to cryotherapy alone. The ES for these comparisons were all very large with CI that did not cross zero. For the CAT study, the authors reported no significant differences on any of the clinician- or patient-oriented outcome measures for the 6- and 12-week comparisons between the intervention and placebo groups.

Evidence Quality: The two studies included had PEDro scores of 7/10 (LAS) and 8/10 (CAT), respectively. The areas where both lost points were 1) no therapists blinding administering the treatment, and 2) no “intention to treat” analysis specified. The LAS study also did not blind patients to treatments. Both studies had greater than 85% follow up in their patients. Based on the PEDro scores these studies were considered these high-quality evidence.

Conclusions: Overall, non-LASER phototherapy appeared to be very effective for pain and edema reduction as well as improving dorsiflexion in LAS when compared to cryotherapy alone over the course of 5 days. The ES for both clinician- and patient-oriented outcomes were very large and the lower limits of the CI would still be considered large ES. For CAT, there were no substantial improvements after at the 6 to 12 weeks follow up period for patient- or clinician-oriented outcomes, but it remains unclear whether there may have been any immediate post-treatment improvements. Based on the evidence from these 2 high quality studies, non-LASER phototherapy may be an important treatment modality for reducing pain and enhancing function, especially for treating acute LAS.

Word Count: 596