**Tumilty S, Munn J, McDonough S, and et al. Low Level Laser Treatment of Tendinopathy: A Systematic Review with Meta-analysis. Photomedicine and Laser Surgery 2010; 28:1: 3-16.**

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**Reviewer:** Linda Metzger 3-25-16

**Design:** Systematic Review with Meta-analysis

**Objective:** To assess the clinical effectiveness of Low Level Laser Therapy (LLLT) in the treatment of tendinopathy.

**Summary of Results:**

* There were conflicting findings from 25 controlled clinical trials for all tendinopathies: 12 showed positive effects and 13 were inconclusive or showed no effect. There were also conflicting findings from 13 controlled clinical trials on lateral epicondylitis. Ten of the lateral epicondylitis trials scored >6 on the PEDro scale, and 4 showed positive effects and 6 were inconclusive or showed no effect.
* Where pooling of data was possible, LLLT showed a positive effect size in 4 studies of lateral epicondylitis (LE) having scores of >6 on the PEDro scale. LLLT participants’ grip strength was 9.59 kg higher than that of the control group.
* The results of this study suggest that LLLT can potentially be effective in treating tendinopathy when recommended dosages are used. The 12 positive studies provide strong evidence that positive outcomes are associated with the use of current LLLT dosage recommendations for the treatment of tendinopathy.

**Reasons not to cite as evidence:**

* The 13 trials on lateral epicondylitis represent an old body of literature. All trials were published between 1991 and 2008.
* The 13 trials on lateral epicondylitis represent a weak body of literature that included biased articles. Even though 10 trials scored >6 on the PEDro scale, only half were deemed high quality with 4 scoring a 7 and only one scoring an 8 on the PEDro scale. In addition, only one study provided allocation concealment, and only 7 trials blinded assessors. Most studies failed to do adequate follow-up beyond 8 weeks. Poor methodology may have increased potential biases and weakened the scientific merit of the works reviewed.
* Only half the studies provided sufficient data to undertake a meta-analysis which can undermine the overall results of the pooled analyses. Also given the variation in comparison interventions used, there was abundant clinical and statistical heterogeneity between studies that did not allow for the calculation of pooled summary estimates for most of the meta-analyses presented. The authors did not explain this high heterogeneity. This can result in misleading conclusions. Removing the study with the brace intervention did explain most of the heterogeneity in the meta-analysis of grip strength and LE. However, the authors failed to explain the high heterogeneity (I2 = 72%) in the meta-analysis of pain and LE. The heterogeneity of the studies precluded the ability of the meta-analyses to assess the overall effect of LLLT.
* Lack of use of valid and reliable outcome measures across studies, particularly important functional outcomes, and inadequate detail in the reporting of these measures, made it difficult to pool data from numerous studies and thus provide any measure of estimated overall effect. The analyses lacked a meaningful functional outcome measure for LE.
* Publication bias is most likely present with LLLT studies, since negative studies rarely get reported or published especially in journals related to LLLT. The authors failed to explore or address this possibility. The performance of a hand search of the literature may have been beneficial in order to minimize the possibility of missing a significant amount of the unpublished literature.
* The status of the evidence is unconvincing. The author’s conclusions are based on only the 12 positive studies, thereby presenting with selective outcome reporting.

**Assessment:**

* Inadequate for evidence of the effectiveness of LLLT in patients with lateral epicondylitis on pain and function.