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Safety and effectiveness of low-level laser therapy in patients with knee osteoarthritis: A systematic review and meta-analysis

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Background: Osteoarthritis of the knee is the most common joint disease and is associated with significant physical disability. Low level laser therapy was introduced as an alternative non-invasive treatment for osteoarthritis about 10 years ago, but its effectiveness is still controversial.

Objectives: The main objective of this article was to determine the safety and efficacy of low level laser therapy in patients with knee osteoarthritis.

Materials & Methods: To gather evidence, main databases [MEDLINE, PubMed, Cochrane Library, Science Direct, Trip, Google Scholar, Institute of Scientific Information (ISI), SCOPUS and EMBASE] as well as relevant websites were searched without time limit up to September 2016. We searched with appropriate keywords and strategies. After quality assessment of studies, study data were extracted by two reviewers. Because all the outcomes were continuous, standard mean difference by using the random-effects model proposed by invers variance was used in the meta-analysis. Twelve values were used for the evaluation of heterogeneity. Analyses were conducted using review manager software.

Results: A total of 823 studies, 652 studies were entered firstly and 14 RCTs were selected after final review. There was significant difference between LLLT and Placebo in pain at rest ($p=0.02$), pain at activity ($p=0.01$), pain total ($p=0.03$), WOMAC function ($p=0.01$), WOMAC stiffness ($p=0.02$) and WOMAC total ($p<0.0001$) in favor of the LLLT. There was no significant difference between LLLT and Placebo in WOMAC pain ($p=0.09$) and range of motion ($p=0.1$).

Conclusions: Although the heterogeneity of the results calls for caution in interpretation, LLLT seemed to be effective in pain relief and functional outcomes. Despite some positive findings, this meta-analysis lacked data on how LLLT effectiveness is affected by important factors: wavelength, energy density, laser continuous output, treatment duration, number of sessions the treatment, lost to follow up, severity of KOA and site of application.

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