

Efficacy of High-Intensity Laser Therapy in Treating Knee Osteoarthritis: A First Systematic Review

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Abstract

Objective: The aim of this study was to evaluate the efficacy of high-intensity laser therapy (HILT) in the treatment of knee osteoarthritis (OA). **Background:** Due to increased number of randomized controlled trials evaluating efficiency of HILT in patients with knee OA, there was a need to present them in the form of systematic review. **Methods:** The search includes the databases as well as a manual search until August, 2017. The quality of the selected articles was determined in accordance with the revised guidelines of the CONSORT statement. **Results:** Six studies were included. Laser fluence ranged from 0.51 to 120 J/cm² for one treatment. The total energy transmitted during one treatment ranged from 1250 to 3000 J. All the selected studies found HILT to be beneficial in treatment of knee OA. **Conclusions:** HILT seems to be efficient in reducing pain and for providing functional improvements in patients with knee OA.

Keywords: efficacy, high-intensity laser therapy, knee osteoarthritis, systematic review

Introduction

KNEE OSTEOARTHRITIS (OA) is a chronic disease occurring mostly among older people.¹ Therefore, it is estimated that the problem of knee OA will be more serious in the future, because of aging population and other factors such as sedentary lifestyle and the increasing prevalence of obesity.² Knee OA can be associated with considerable physical disability, regardless of the type of affected joints. The most common symptoms of OA are inflammation and swelling of the synovia, which could lead to increased pain, stiffness, bone spurs, and restricted range of motion.³ These symptoms impair functional status and quality of life.⁴

The conservative treatment forms for knee OA consist of pharmacological and nonpharmacological modalities. Non-steroidal anti-inflammatory drugs are broadly used for pain relief and rigidity caused by OA. Nonetheless, they contribute to numerous side effects, particularly on the gastrointestinal tract, making the treatment unsustainable.⁵ To reduce or eliminate these complications, nonpharmacological treatments have been utilized. Widely used nonpharmacological approaches include patient education, weight management strategies, kinesiotherapy, manual therapy, orthotic devices,² and physical agent modalities such as electrotherapy, sonotherapy, and low-level laser therapy (LLLT).⁶ The main

purposes of the aforementioned treatments are pain reducing and improving functional status for a better quality of life.

In the past decade, high-intensity laser therapy (HILT) was implemented as a new form of therapy, but is not a routinely used treatment modality. HILT in these studies use neodymium-doped yttrium aluminum garnet lasers with high-peak-power (3 or 1 kW). The laser with the wavelength of 1064 nm induces slow light absorption by chromophores and transmits radiation into deep tissue to insure effectiveness of the therapy.⁷ The benefit of HILT over LLLT is that HILT can stimulate deeper tissues, due to the higher output power.⁸ Moreover HILT is recognized as a safe, painless, effective, and noninvasive treatment option.⁹ Many researchers have shown the favorable impact of HILT in patients with different disorders such as knee OA,¹⁰ subacromial impingement syndrome,¹¹ frozen shoulder,¹² osteoporosis,¹³ chronic back pain,¹⁴ and postburn pruritus.¹⁵

In the literature, there are increased number of randomized controlled trials (RCTs) evaluating efficiency of HILT in management of knee OA. Thus, they should be presented in the form of systematic review. Therefore, the purpose of our study was to assess, through a systematic review, the efficacy of HILT on pain reduction and functional improvement in patients with knee OA. The efficacy of this therapeutic modality was critically evaluated.