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ORIGINAL ARTICLE

Does addition of low-level laser therapy (LLLT) in conservative care of knee arthritis successfully postpone the need for joint replacement?

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Abstract The current study evaluates whether the addition of low-level laser therapy into standard conventional physical therapy in elderly with bilateral symptomatic tri-compartmental knee arthritis can successfully postpone the need for joint replacement surgery. A prospective randomized cohort study of 100 consecutive unselected elderly patients with bilateral symptomatic knee arthritis with each knee randomized to receive either treatment protocol A consisting of conventional physical therapy or protocol B which is the same as protocol A with added low-level laser therapy. The mean follow-up was 6 years. Treatment failure was defined as breakthrough pain which necessitated joint replacement surgery. After a follow-up of 6 years, patients clearly benefited from treatment with protocol B as only one knee needed joint replacement surgery, while nine patients treated with protocol A needed surgery ($p<0.05$). We conclude low-level laser therapy should be incorporated into standard conservative treatment protocol for symptomatic knee arthritis.

Keywords Knee pain · Osteoarthritis · Outcome · Laser therapy

Introduction

The importance of low-level laser in clinical medicine dates back to the 1960s from the important works of Endre Mester. The various clinical applications of low-level laser therapy (LLLT) in recent years were mainly based on previous scientific works concerning the effect of low-level lasers which provide pain relief in knee arthritis by means of improved microcirculation [1] while at the same time exert a positive influence on ATP synthesis on a cellular level [2] as well as cellular-molecular level on fibroblast [3] and collagen synthesis [4].

As far as knee osteoarthritis pain is concerned, most clinicians employ the use of nonsteroidal anti-inflammatory medications and conventional physical therapy consisting of ultrasonic therapy, transcutaneous electrical therapy, and shortwave therapy. These forms of conservative treatment modalities represent symptomatic treatment only without bio-modulation effects offered by low-level lasers; for instance, ultrasound treatment affords neither anti-inflammatory nor bio-modulation effects on a cellular-molecular level.

Although there have been numerous clinical studies on the use of LLLT in various forms of arthritis especially rheumatoid arthritis where the inflammatory component is even more prominent than degenerative osteoarthritis [5], there is a relative paucity of clinical studies on LLLT's clinical efficacy in the medium to long term, nor any study to investigate whether incorporation of LLLT into treatment protocol can help prevent the need for joint replacement surgery. This is important as a treatment modality in general is useful only if the beneficial clinical effects arising therefrom can last over time and particularly since low-level laser therapy is noninvasive and does not involve high costs on the patient, with the cost of a standard protocol of 6 weeks in the author's institution being the same as conventional physical therapy modality. The objective of the current study is therefore to evaluate whether the addition of low-level laser therapy into standard conventional physical therapy in elderly with bilateral symptomatic tri-compartmental knee arthritis can successfully postpone the need for joint replacement surgery.

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