

A systematic review with meta-analysis of the effect of low-level laser therapy (LLLT) in cancer therapy-induced oral mucositis

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Received: 26 August 2010 / Accepted: 30 May 2011 / Published online: 10 June 2011
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Abstract

Purpose The purpose of this study is to review the effects of low-level laser therapy (LLLT) in the prevention and treatment of cancer therapy-induced oral mucositis (OM).
Methods A systematic review and meta-analysis of randomised placebo-controlled trials of LLLT performed during chemotherapy or radiation therapy in head and neck cancer patients.

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Results We found 11 randomised placebo-controlled trials with a total of 415 patients; methodological quality was acceptable at 4.10 (SD±0.74) on the 5-point Jadad scale. The relative risk (RR) for developing OM was significantly ($p=0.02$) reduced after LLLT compared with placebo LLLT (RR=2.03 (95% CI, 1.11 to 3.69)). This preventive effect of LLLT improved to RR=2.72 (95% CI, 1.98 to 3.74) when only trials with adequate doses above 1 J were included. For treatment of OM ulcers, the number of days with OM grade 2 or worse was significantly reduced after LLLT to 4.38 (95% CI, 3.35 to 5.40) days less than placebo LLLT. Oral mucositis severity was also reduced after LLLT with a standardised mean difference of 1.33 (95% CI, 0.68 to 1.98) over placebo LLLT. All studies registered possible side-effects, but they were not significantly different from placebo LLLT.

Conclusions There is consistent evidence from small high-quality studies that red and infrared LLLT can partly prevent development of cancer therapy-induced OM. LLLT also significantly reduced pain, severity and duration of symptoms in patients with cancer therapy-induced OM.

Keywords Low-level laser therapy · Oral mucositis · Cancer · Chemotherapy · Radiation therapy

Introduction

Oral mucositis (OM) is a serious and acute side-effect for patients undergoing cancer therapy. The frequency of its appearance varies with therapy and cancer type up to 100% in oral cancer patients receiving adjuvant chemotherapy or radiotherapy [1, 2].

OM has great impact on a patient's well-being. It may necessitate modifications of treatment planning, suspension