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Photobiomodulation and Oral Mucositis: A Systematic Review

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Abstract

Oral mucositis (OM) is a debilitating complication of chemotherapy, and head and neck radiotherapy. In an effort to offer the best possible advice within the limitations of published research, a systematic review with an extended discussion and commentary on dosimetry and dose delivery is presented. Using keywords as listed, Pubmed, Google Scholar and Cochrane databases were searched during a period extending from 1995 to 2019. A total of 782 abstracts were identified. A total of 50 papers were analysed, and of these, 29 satisfied criteria required for systematic review in accordance with an optimized PRISMA statement. Clinical outcome as reported was subject to analysis with respect to time of intervention, incidence and severity of oral mucositis, and pain amelioration, and a comprehensive combined univariate and multivariate statistical analysis of the methods employed was performed. Recommendations are made with respect to the timing of the intervention. Moreover, there is an extended discussion available on the treatment care rationale of photobiomodulation (PBM), and its adjunctive association with OM. In conclusion, early prophylactic application offers clear advantages in clinical management. The many studies and associated variables and covariables assessed here revealed a choice of delivery techniques, associated wavelengths and many further indices to consider with regard to the accomplishment of optical parameters. It is therefore our recommendation that clinicians use PBM as a therapy with a full and proper understanding and training in order to optimise the clinical effects achievable.

Keywords: LED; LLLT; cancer; chemotherapy; laser; low-level laser therapy; oral mucositis; photobiomodulation; radiotherapy; stomatitis.

Figures

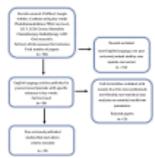


Figure 1 PRISMA flow-chart of selected criteria...

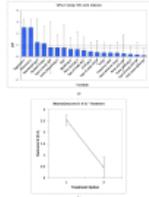


Figure 2 (a) , Estimated mean...



Figure 3 Proposed treatment decision tree—pain or...

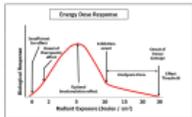


Figure 4 Multiphasic dose response.

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