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Photobiomodulation: A Systematic Review of the Oncologic Safety of Low-Level Light Therapy for Aesthetic Skin Rejuvenation

Graeme Ewan Glass

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Abstract

Photobiomodulation (PBM) therapy is an increasingly popular modality for aesthetic skin rejuvenation. PBM induces genomic, proteomic, and metabolomic processes within target cells, but such manipulation of cell behavior has led to concerns about oncologic safety. This article presents a summary of the clinical and preclinical evidence for the oncologic safety of PBM for aesthetic skin rejuvenation. A focused systematic review was performed, in which safety data from clinical trials of PBM for skin rejuvenation was supplemented by analyses of in vitro data obtained from cells derived from human skin and human neoplastic cells and in vivo data of tumors of the skin, oral cavity, and

breast. Within established parameters, red and near infrared light mainly enhances proliferation of healthy cells without a clear pattern of influence on cell viability. The same light parameters mainly reduce neoplastic cell proliferation and viability or else make no difference. Invasiveness potential (appraised by cell migration assays and/or differential gene expression) is equivocal. PBM does not induce dysplastic change in healthy cells. In vivo tumor models yield varied results with no clear pattern emerging. There are no relevant clinical trial data linking PBM with any significant adverse events, including the finding of a new or recurrent malignancy.Current clinical and preclinical evidence suggests that PBM is oncologically safe for skin rejuvenation, and there is no evidence to support the proposition that it should be avoided by patients who have previously undergone treatment for cancer.

Figures

Figure 1. Study selection.

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