Impact of photobiomodulation therapy on oral squamous cell carcinoma: evaluation of apoptosis and autography in cell lines and patient-derived xenografts

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Resume

Objectives. The present research project proposes to evaluate apoptosis and autophagy in cell lines derived from oral squamous cell carcinoma (CAL-27, SCC-9 and SCC-25) and in samples of patient-derived xenografts of oral squamous cell carcinoma irradiated and non-irradiated with photobiomodulation therapy.

Methods. The caspase-3 activity, the presence of autophagic vacuoles and the quantification of cell morphological changes will be measured in the cell lines using the high-resolution 3D Cell explorer microscope (Nanolive). In the patient-derived xenografts of oral squamous cell carcinoma, Bax, Bcl-2 and LC3II genes and proteins will be analyzed by RT-qPCR and immunohistochemistry, respectively.

Expected results. It is expected to advance in the molecular knowledge of neoplastic cells irradiated with specific laser parameters for the management of oral mucositis. Knowing about the molecular effects of photobiomodulation therapy on tumor cells could generate potential clinical benefits and produce knowledge about the biosafety of this therapy, already widely used in cancer patients.

Key words. Oral mucositis, photobiomodulation therapy, apoptosis, autophagy

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