

## Low Level Laser Therapy Contributes to the Prevention of Mucositis and Immunity Against Sars-CoV-2

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### Abstract

*Patients who are undergoing chemotherapy and radiotherapy treatments for head and neck are susceptible to developing Oral Mucositis (OM) in the oropharyngeal region. OM, if not properly treated, directly influences nutritional function and reduces immune defense, facilitating the spread of opportunistic infections and Sars-Cov-2 due to the presence of angiotensin-converting enzyme 2 (ECA2) present in the salivary glands. Low Level Laser Therapy (LLLT) appears as a treatment option, which prevents the manifestation of OM and promotes homeostasis in the defense cells and respiratory system.*

**Keywords:** Mucositis; LLLT; Sars-Cov-2; Laser.

Oral mucositis (OM) is a common and limiting cytotoxic effect of cancer treatment. If it evolves to its severe form, it may lead to the need to stop anti-cancer therapy, which will make it more difficult to cure the neoplasia in its primary stage. OM can also increase the risk of local and systemic infection and affect the quality of life and the cost of the treatments offered. Current care for patients with mucositis includes adequate oral hygiene, a non-irritating diet and 0.12% chlorhexidine-based rinses [1].

Due to the relatively high number of cases of cancer patients presenting with irritating pseudomembranous manifestations caused by mucotoxic antineoplastic drugs in the oral cavity, it is important that the clinical and scientific community organize preventive strategies, in times of global pandemic, so that lesions located in the oral cavity, including mucositis, do not become a gateway for the progression of Sars-CoV-2.

Covid-19 is the official name given to the disease caused by Sars-Cov-2 which means "severe acute respiratory syndrome coronavirus 2". This disease affects mainly important organs of the human body where the virus has the

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ability to unite, through receptors of angiotensin-converting enzyme 2 (ECA2) present in the cells of the lungs, kidneys, heart, intestine and in greater concentration in the salivary glands [2].

This only reinforces the idea that patients who are undergoing oncological therapies and possible mucotoxic manifestations in the mouth, need to be closely monitored by the multidisciplinary team so that undesirable systemic repercussions do not occur, mainly due to the evolution of the coronavirus, through the ECA2 of the salivary glands and opportunistic infections due to the immune drop.

When the normal cell is infected by the coronavirus, there will be a release of Type 1 interferons (alpha and beta) that will stimulate the immune system to produce antiviral genes that will neutralize the viral load through neutralizing antibodies. Simultaneously, CD8 T lymphocytes that constitute the majority of the pulmonary inflammatory infiltrate will be protecting the lung tissue, however the immune response causes these lymphocytes to destroy the parenchyma itself due to the viral cluster present in high concentration within the alveoli [3].

Relevant studies have elucidated in patients that the LLLT was able to modulate pulmonary inflammation, reducing the number of cells in the Bronchoalveolar Lavage Fluid (BAL), increasing the level of IL-10 which reduced the production of mucus, peribronchial eosinophils, collagen deposition, bronchoconstriction index, bronchial and muscle thickening in the airways, increased uptake of oxyhemoglobin, reduced blood pressure - heart rate [4,5] and extremely effective in preventing and treating oral mucositis induced by chemoradiotherapy, reducing pain and promoting tissue healing [6,7].

In this imprecise context of potentiation of mucositis in immunosuppressed patients and apprehension regarding the evolution of Sars-CoV-2, non-invasive therapies related to the use of the Low-Level LASER Therapy (LLLT), according to global literature, can contribute to the physiological balance of the oropharyngeal region and improving the body's defense system.

In this current scenario of so many uncertainties, it is necessary to use new tools that act in the progress of the prevention and treatment of OM against Sars-CoV-2, aiming at improving the quality of life, reducing care costs and facilitating the completion of more intensive chemotherapy and radiation therapy protocols for cancer [8,9].

In addition, the use of LLLT as a form of improved mucositis management can allow the improvement of cancer treatment protocols that are currently excessively harmful, and consequently may produce higher cure rates [10-13].

The continuation of research related to the use of LLLT to the pathogenesis of Covid-19 [14] and management of OM will undoubtedly lead to the development of possible interventions and improvement of patient care, whether in outpatient or hospital settings.

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