Laser Photobiomodulation in Chronic Rhinosinusitis

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Background: In the last years there has been a significative increase in the incidence of chronic rhinosinusitis (CRS) worldwide. Particularly, the incidence of allergic causes of CRS showed a constant increasing in the general population. Medical therapy and surgery, where indicated, present a high rate of success. However, not all the times it is possible to solve problems and symptoms caused by these pathologies, that can affect the quality of life of patients. Currently, a gold standard treatment for the disease does not exist, and CRS is principally treated by antimicrobial and anti-inflammatory drugs and/or by endoscopic sinus surgery. To date, only few studies have examined the effect of laser photobiomodulation (LPBM) therapy on CRS, demonstrating its effectiveness in reducing symptoms of the disease. The LPBM has proven anti-inflammatory effects on human tissues, demonstrated since 1968. The Authors have been using this technique since 1979.

Aim of the study: The aim of our research was to verify the anti-inflammatory effects of the LPBM applied directly into the nose, using different sessions in a single day following our new protocols.

Patients and methods: In the last three years, the Authors have treated more than 150 patients suffering from CRS, occurred from at least 3 months and not eliminated by conventional medical therapy. The study population included CRS-affected male and female patients, aged 12-80 years, including both allergic and non-allergic patients, treated by LPBM (cases). An age and gender matched group of CRS patients, not treated by laser therapy but with the best medical therapy, was used as control group. We irradiated our cases with a laser diode 808 nm in optical fiber (Euphoton, Trieste, Italy), applied directly on the nose of the patient, with 4 Joule/scm in average. All the other therapies were interrupted before laser treatment. Effectiveness of laser treatment was assessed based on the presence/absence of post-operative inflammation, measured with clinical devices (CT scan, nose endoscopy, rhinomanometry and nasal cytology) and on the self-evaluated degree of satisfaction of operated patients (SNOT-22 questionnaire).

Results and Discussion: LPBM-treated patients showed a good reduction of inflammation, also confirmed by the appreciation of post-operative results by the majority of patients, associated with no need for using heavy local and general therapy, both in allergic and non-allergic operated CRS patients. A symptom-free follow-up was reported after one year. Our experience confirmed that LPBM can be an ancillary therapy or support therapy for a high percentage of patients with CRS, without having the adverse events commonly associated with local and general medical therapies, such as corticosteroids and vasoconstrictor drugs. This protocol of use of low laser therapy is safe, well tolerated and effective on the reduction of CRS symptoms.