

We studied changes of 15 hemostasis parameters in 20 volunteers after single and 4 daily exposures to VIS+IR polarized light (phototherapeutic device “Biopton-2”, 12 J/cm², small area of the back). The blood for testing (15 ml) was drawn before the trials in 0,5 hr, 24 hr after the 1st light-session and on 5th day, prior to the 5th session. In Placebo group (16 non-irradiated volunteers) blood samples were drawn at the same volume and at the same time-intervals.

In 0,5 hr after the 1st hemoexfusion in the non-irradiated volunteers there occurred activation of the intravascular P1_s aggregation (increase of the amount of P1_s involved in aggregates, particularly in large- and middle-sized aggregates rose (up to 181% of the initial value). In irradiated volunteers only tendency to such changes was observed and in 24 hr, there occurred a pronounced, inhibition of the intravascular P1_s aggregation (the number of large and middle-sized aggregates decreased to 32-36% of the initial values). In this group in 30 min after the 1st session activity of natural anticoagulant- antithrombin-III(AT-III) increased; in 24 hr the content of the tissue plasminogen activator –tPA rose, while in Placebo group it was markedly reduced (up to the 5th day).

The light- induced changes in hemostasis system are favorable for people, predisposed to thromboses which should be clinically tested. Recommendation: to test the light-effectiveness at cardio-vascular pathology.

EFFECTIVENESS OF PHOTOBIMODULATION ON THE INCREASE OF TREG CELLS AND IL-10 CYTOKINE IN AN EXPERIMENTAL MODEL OF CHRONIC ASTHMA

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The asthma is characterized by activation of Th2 lymphocytes and production of cytokines, eosinophilic inflammation, oedema and increased secretion of mucus. Thus, immunotherapeutic strategies, as photobiomodulation (PBM), aim at a negative regulation of cytokines, chemokines and transcription factors. Tregs lymphocytes are known to suppressing the migration of other effector cells and eosinophils into the tissues, as well as the release of inflammatory mediators. In this sense, the objective was to evaluate Foxp3 Treg cells, as well as the production of IL10 in the lung after PBM. We studied some parameters in Balb/C with asthma submitted to photobiomodulation (660nm, 100mW, 150s) for 15 days. The protocol used for the induction of asthma consisted of sensitization with ovalbumin - OVA (day 0 and day 14) and orotracheal challenge on day 21 (3x per week/5 weeks). Bronchoalveolar lavage (BAL) and lungs were collected for analysis. The data were submitted to the One-way ANOV A test followed by the Newman-Keuls test. Significance levels adjusted to 5% (p<0.05). We observed reduction in CD11b (p<0.01), T-CD4+ (p<0.05), LY6G (p<0.01) and Siglec-F (p<0.001). Increased (Foxp3), as well as IL10 cytokine, CD4+ CD25+ T lymphocytes in BAL, reduced the IL4, IL5 and IL13 cytokines (p<0.001) and increased IL10 (p<0.001). there was a reduction in the LTB4 level (p<0.01) and methacholine tracheal responsiveness (MCh) (p<0.001). There was a reduction in collagen and mucus (p<0.001). Thus, laser therapy can be used as an immunotherapeutic strategy for the treatment of asthma through the possible mechanism of increase of CD4+CD25+ Foxp3+ and CD4+IL-10+.

PHOTOBIMODULATION ACTIVATES GLUCOSE UPTAKE IN BROWN ADIPOSE TISSUE OF OBESE MICE

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Mammal fat consists of white and brown adipose tissues (WAT and BAT). Although most fat is energy-storing WAT, brown adipocytes dissipate energy as heat. Obese subjects exhibit BAT hyporesponsiveness to classical stimuli as cold, hence increasing BAT thermogenic capacity could be an interesting target for treating obesity. Photobiomodulation (PBM) seems to be a feasible alternative to activate BAT, although it has not been applied for this purpose until now. In this study, adult C57Bl/6 mice were fed with a hyperlipidic diet (HF) during 15 weeks to induce obesity. Then, they were divided into two groups: HF and HF660. The interscapular BAT of HF660 mice was exposed to a single irradiation using a 662 ± 20 nm LED (5.7 Jcm⁻² at 19 mWcm⁻², delivered during 300 s). The HF group was sham-irradiated. Eutrophic animals were also used. Animals received 200 mCi of ¹⁸F-FDG and were exposed to cold for basal register of PET-CT images. After PBM or sham treatment, mice were once again exposed to cold before PET-CT image acquisition. Our results showed that PBM was able to activate BAT in obese mice through higher glucose uptake. In contrast, PBM and sham-irradiated normal fed mice presented similar levels of glucose uptake. Taking together, our findings suggest that PBM applied to the BAT is able to promote glucose uptake by obese mice and could be an interesting approach to manage obesity and its correlated morbidities.

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EVALUATION OF PHOTOBIMODULATION IN SALIVAR PRODUCTION OF PATIENTS WITH ANTI-HYPERTENSIVE DRUG-INDUCED XEROSTOMIA

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Hypertension is a systemic condition that affects about 30% of the world population, according to data from the World Health Organization. Drugs used to control this disease have the potential to induce xerostomia, a buccal condition in which it is observed the decrease of the salivary flow and whose presence leads to the increase the index of caries, periodontal disease, until loss the teeth, dysgeusia, difficulty of mastication, dysphagia, bad breath, oral burning and impairment of the works installed in the buccal cavity, including retention of removable and total dentures. Photobiomodulation has been shown to be effective in increasing saliva production in many conditions. A randomized, controlled trial is proposed. The patients (60) will be divided in 2 groups: G1: treatment with PBM (30); G2 simulate PBM (30). The method consists in the application of infrared laser in the three pairs of major salivary glands, one time per week, during 4 weeks. The parameters used will be: Laser Diode, DMC brand, emitting at λ = 808 nm, 4 J/dot, CW, incidence (90⁰) to the surface irradiated and in contact with it, distributed in 6 external points in each parotid, 2 external points in each sublingual and 2 points in each submandibular (internal), totaling 20 points. This protocol will determine the effectiveness of photodynamic therapy in xerostomia induced by antihypertensive drugs.