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Opinion Article

Can Systemic Photobiomodulation Help Coronavirus Anti-Viral Immunity?

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In times of personal and scientific uncertainty, the world has become insecure and confused, causing a dark impact on humanity due to a small being, less than 0.2 µm, formed by a protective capsule and genetic material. Nice to meet you: Covid-19 disease, SARS-CoV-2 virus and family of corona viruses.

This pandemic disease has a characteristic of high interpersonal contagion power and rapid spread of infection with high levels of morbidity and mortality associated with SARS-CoV, which requires careful monitoring of the recurrence of transmission and preparations for the rapid implementation of control measures. Global outbreaks have demonstrated the ease with which this virus can sow and spread in human populations when cases remain undetected or when infected people are not seen in monitored environments with a low risk of transmission [1].

In more severe cases there is an evolution to Severe Acute Respiratory Syndrome (SARS) which is infectious and causes rapid systemic demotion of the patient. This acute respiratory disease has very severe signs and symptoms, and most of the demoted patients develop radiographic evidence of pneumonia and require hospitalization to reduce their condition [1,2].

SARS-CoV-2 infection can trigger a series of humoral and cellular immune responses. Specific immunoglobulin antibodies (IgG and IgM) have already been detected approximately 2 weeks after infection, and in some cases it can remain at high levels up to 180 days after infection [3]. High amounts of neutralizing antibodies and SARS-CoV-2 specific cytotoxic T-lymphocyte responses were detected in patients who recovered from SARS [4,5], and response levels correlated well with the outcome of the disease [6]. This suggests that humoral and cellular immune responses are crucial for eliminating SARS-CoV infection.

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Currently, pharmacological and hematological treatments are being used and studied worldwide, through clinical or laboratory research, seeking a relative or absolute remission of the disease, while a safe vaccine certified by the World Health Organization is not feasible. Current treatments involve numerous protocols [7]: Favipiravir; Deferoxamine; Convalescent plasma; Tocilizumab / Methylprednisolone; Hydroxychloroquine / Azithromycin / Lopinavir / Ritonavir; Isotretinoin; Clevudine; Hyperbaric Oxygen Therapy; Clopidogrel / Rivaroxaban; Huaier Granule; DAS181; Ivermectin and Nitazoxanide; Dapagliflozin; Recombinant human angiotensin converting enzyme 2; Ruxolitinib; Baricitinib; Lenalidomide; Acalabrutinib; Ruxolitinib; Interferon Beta-1ª; Umifenovir; ciclesonide; Peginterferon Lambda-1ª; Stromal Mesenchymal Cells; Sarilumab; Leflunomide; Sildenafil citrate; Telmisartan; Sargramostim; CamostatMesilate; Etoposide; Enoxaparin; Chlorpromazine; Sirolimus; Allogeneic HB-adMSCs; Remdesivir; Nitazoxanide; Telmisartan; Clazakizumab; HB-adMSCs; Vazegepant; WJ-MSCs; Tetrandrine; NestCell® mesenchymal; ACE inhibitor; Tranexamic acid; Dexamethasone; Defibrotide.

Amid such difficulty in defining a more unique therapy for the treatment of SARS-CoV-2, it is possible that non-drug techniques may become reasonable in this pandemic moment. A therapeutic example for these infected people with less deleterious effects, without invasiveness and simple technique, would be the Transdermal Systemic Photobiomodulation (PBMS), through low intensity LASER devices that stimulate a greater hematosis process at the level of lung parenchyma and increased immunity [8,9].

PBMS has been used for 4 years at the Cancer Hospital of Ribeirão Preto with excellent results in patients with malignant neoplasms, with significant improvements in biomarkers, immunity, analgesia, tissue repair and anti-inflammatory processes. The preferred site for irradiation of non-invasive transdermal PBMS is the anatomical region of the Primitive Carotid Artery (ACP) for a predetermined time (5 min to 30 min) so that the systemic homeostatic effects are reflected during treatment [10]. There is a modulation related to the activity of macrophages, neutrophils and lymphocytes that will act to inhibit the production of pro-inflammatory cytokines and block the infiltration of these defense cells so that they do not penetrate the lesion [11]. Another mechanism is related to red blood cell concentrations during low intensity LASER irradiation with rapid increase in oxygen saturation (Spo2) and uptake of oxyhemoglobin with a positive impact on the defense and respiratory system [12].

After 2 months of quarantine in Brazil, there are no cases of patients infected with corona virus in this hospital unit (Hospital de Cancer de Ribeirão Preto) until the present date of this publication.

I reiterate that transdermal PBMS is being used with care and quite effectively for the pathophysiological control of neoplasms of solid tumors in this health unit, and in a refractory manner for the prevention of Covid-19.

This is not a new panacea, so it is important that we deepen the studies related to these clinical-laboratory observations of the PBMS and its effects on the corona virus so that the scientific conclusions remain promising and rational.

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