PROCEEDINGS OF THE 7TH WFOT MEETING; 2022 MAY 6-7; BUCHAREST, ROMANIA

Medical ozone. Pharmacological mechanisms as basis of its effectiveness on the autoimmune response, vascular disorders, surgery and COVID-19 SARS-CoV-2.

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OPEN ACCESS

Citation
León-Fernández O.S. Medical ozone. Pharmacological mechanisms as basis of its effectiveness on the autoimmune response, vascular disorders, surgery and COVID-19 SARS-CoV-2 [abstract]. Proceedings of the 7th WFOT Meeting; 2022 May 6-7; Bucharest, Romania. J Ozone Ther. 2022;6(7).
doi: 10.7203/jo3t.6.7.2022. 25972.

Academic Editor
Jose Baeza-Noci,
School of Medicine, Valencia University, SPAIN

Editor
World Federation of Ozone Therapy, Brescia, ITALY

Received
Jun 1, 2022

Accepted
Jun 1, 2022

Published
Dec 30, 2022

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ABSTRACT

Medical ozone is a therapeutic concept of proven pleiotropy. This means that it will have different effects on multiple pharmacological targets, which have been identified in hundreds of studies (experimental and clinical) on disease models and patients. These targets are closely connected to each other and can occur in different diseases. A good example is the “cytokine storm” in rheumatoid arthritis as well as in COVID-19 SARS-CoV-2. Therefore, the aim of this presentation is to highlight the therapeutic effects of medical ozone in different diseases, their interrelationship, and ozone application in pathological processes with an oxidative etiology.

In animal models and in patients with rheumatoid arthritis, medical ozone has been shown to reduce proinflammatory cytokines (TNF-α and IL-1β) that contribute to “cytokine storm,” to synovitis, cartilage- and bonedamaging autoantibodies and oxidative stress. Vascular complications in patients with diabetes were reduced when superoxide radical scavengers increased, mediated by medical ozone, restoring normal metabolic pathway functions and pancreatic integrity. Ozone prevented ischemic reperfusion injury and improved the systemic condition and quality of life of patients with knee osteoarthritis before and after arthroscopy.

The integration of the above and other results was the basis for the introduction of medical ozone as a successful treatment in a new disease: COVID-19.