

Therapeutic efficacy of ozone in patients with diabetic foot

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Abstract

Oxidative stress is suggested to have an important role in the development of complications in diabetes. Because ozone therapy can activate the antioxidant system, influencing the level of glycemia and some markers of endothelial cell damage, the aim of this study was to investigate the therapeutic efficacy of ozone in the treatment of patients with type 2 diabetes and diabetic feet and to compare ozone with antibiotic therapy. A randomized controlled clinical trial was performed with 101 patients divided into two groups: one ($n=52$) treated with ozone (local and rectal insufflation of the gas) and the other ($n=49$) treated with topical and systemic antibiotics. The efficacy of the treatments was evaluated by comparing the glycemic index, the area and perimeter of the lesions and biochemical markers of oxidative stress and endothelial damage in both groups after 20 days of treatment. Ozone treatment improved glycemic control, prevented oxidative stress, normalized levels of organic peroxides, and activated superoxide dismutase. The pharmacodynamic effect of ozone in the treatment of patients with neuroinfectious diabetic foot can be ascribed to the possibility of it being a superoxide scavenger. Superoxide is considered a link between the four metabolic routes associated with diabetes pathology and its complications. Furthermore, the healing of the lesions improved, resulting in fewer amputations than in control group. There were no side effects. These results show that medical ozone treatment could be an alternative therapy in the treatment of diabetes and its complications.

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Keywords: Ozone; Diabetes (and its complications); Diabetic foot; Oxidative stress; Antioxidant defense system

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Effect of Ozone Exposure On Lung Mitochondrial Oxidative Metabolism

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and Donald L. Dungworth

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Immunopharmacology and inflammation

Ozone oxidative postconditioning ameliorates joint damage and decreases pro-inflammatory cytokine levels and oxidative stress in PG/PS-induced arthritis in rats



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ABSTRACT

Rheumatoid Arthritis (RA) is the most prevalent chronic condition present in ~1% of the adult population. Many pro-inflammatory mediators are increased in RA, including Reactive Oxygen Species such as nitric oxide NO, pro-inflammatory cytokines as tumor necrosis factor alpha (TNF- α), interleukin-1beta (IL-1 β) and other molecules. Ozone oxidative postconditioning has regulatory effects on some pathological targets associated with RA. Thus, the aim of this study was to investigate the efficacy of ozone therapy in PG/PS-induced arthritis in rats in point of joints inflammation and morphology. Moreover, cytokines, nitric oxide and oxidative stress levels in spleen homogenates were evaluated. Ozone treatment ameliorated joint damage, reduced TNF- α concentrations as well as TNF- α and IL-1 β mRNA levels. Besides, cellular redox balance, nitric oxide and fructolysine levels were reestablished after ozone oxidative postconditioning. It was concluded that pleiotropic ozone's effects clarify its therapeutic efficacy in RA. Decreasing inflammation and joint injury, reduction of pro-inflammatory cytokines, TNF- α and IL-1 β transcripts and re-establishment of cellular redox balance after ozone treatment were demonstrated.

Low-Dose Medical Ozone: Evidence-Based Medicine. The Safety and Effectiveness of Ozone Autohemotherapy. A Metaanalysis

Renate Viebahn-Hänsler, Olga Sonia León, Ziad Fahmy

Key words: low-dose ozone concept, MAH (major autohemotherapy), ozone-peroxide-signal transduction, guidelines, ozone therapy

Introduction

Despite the fact that its mechanisms of action are well known and established, its indications and forms of application have been backed by preclinical and clinical studies, and guidelines for ozone therapy have been internationally published, the use of ozone in medicine is still controversially discussed.

By means of literature data analysis, the authors here demonstrate that the main procedure in systemic ozone treatment, i.e. MAH (major autohemotherapy), in all its classical indications associated with chronic inflammatory conditions, is safe, effective and evidence-based.

Materials and Methods

Out of 65 studies published in international peer-reviewed scientific journals, 30 are analyzed in the context of procedure consistency, safety, effectiveness, and adverse events. Each publication is submitted to critical evaluation, selected in line with extensive, specific and detailed exclusion and inclusion criteria, and subjected to relevant assessment based on international evidence classification.

Results and conclusion

In total 585 patients - 346 in control groups - received 11,207 MAH applications without complication. There were no adverse effects, 2 precautions are reported. Statistics, benefit/risk relation and evidence correlation show that major ozone autohemotherapy is effective, safe and evidence-based.