RESEARCH TOPIC-MEM10
EFFICACY ANALYSIS AND DEVELOPMENT OF NEW THERAPEUTIC STRATEGIES WITH OXYGEN-OZONE THERAPY FOR THE TREATMENT OF MUSCULOSKELETAL DEGENERATIVE DISEASES

Curriculum MEM Clinical

Clinical Unit name and address: Department of Rehabilitation and Functional Recovery, Humanitas Clinical and Research Center-IRCCS

Laboratory name: Department of Orthopedy, Humanitas Clinical and Research Center - IRCCS

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Abstract

The promising medical effects of ozone are increasingly being considered in recent years especially in the treatment of degenerative musculoskeletal disorders (1). Ozone produces acute and transitory oxidative stress with a paradoxical antioxidant effect in biological tissues (2). The controlled administration of ozone is supposed to reduce pain, to have protective immune modulation effects on cartilage, and to reduce cellular oxidative stress, thus potentially representing an alternative to other injective methods (3). Nevertheless, the scientific evidence regarding both its effectiveness and safety is poor, and adequately performed prospective randomized controlled trials and systematic reviews are definitively needed (4,5). In this project, the candidate will study the effect of oxygen-ozone therapy and develop new ultrasound-guided injection techniques in the treatment of most common and disabling orthopedic diseases: knee osteoarthritis and low back pain.

Main technical approaches
For knee osteoarthritis study, the candidate will:
a) study the effectiveness of a treatment with intra-articular ultrasound-guided injections of oxygen-ozone
b) compare the results with the most currently used treatment: intra-articular injections of hyaluronic acid
c) investigate the correct treatment protocol with oxygen-ozone therapy for knee osteoarthritis
For these aims, the candidate will elaborate a prospective double-blind controlled randomized trial.

For low back pain study, the candidate will:
a) analyze the most current evidence in the scientific literature on the effectiveness of treatment by oxygen-ozone therapy
b) compare the results with the most current and used minimally invasive and conservative approaches
c) develop and study a new ultrasound-guided infiltrative technique for the treatment of low back pain with disc hernia
For these aims, the candidate will elaborate a systematic review and, if possible, a meta-analysis on the available literature evidence for the oxygen-ozone treatment. The candidate will also elaborate a study on the use of a new periradicular ultrasoud-guided oxygen-ozone treatment technique for the therapy of lumbar disc herniation.

Scientific references

1) Elvis A, Ekta J. Ozone therapy: A clinical review. J Nat Sci Biol Med. 2011;2(1):66

2) Borrelli E, Alexandre A, Iliakis E, Alexandre A, Bocci V. Disc herniation and knee arthritis as chronic oxidative stress diseases: The therapeutic role of oxygen –ozone therapy. J Arthritis 2015;4:3

3) Paoloni M, Di Sante L, Cacchio A, et al. Intramuscular oxygen-ozone therapy in the treatment of acute back pain with lumbar disc herniation: a multicenter, randomized, double-blind, clinical trial of active and simulated lumbar paravertebral injection. Spine (Phila Pa 1976). 2009;34(13):1337-1344.

4) Sconza C, Respizzi S, Virelli L, Vandenbulcke F, Iacono F, Kon E, Di Matteo B. Oxygene-Ozone Therapy for the Treatment of Knee Osteoarthritis: A Systematic Review of Randomized Controlled Trials. Arthroscopy 2020;36:277-286.

5) Costa T, Linhares D, Ribeiro da Silva M, Neves N. Ozone therapy for low back pain. A systematic review. Acta Reumatol Port. 2018 Jul-Sep;43(3):172-181.

Type of contract

Place without scholarship.

Posizione senza borsa.

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