EUROPEAN OZONE CONGRESS
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Scientific evidence about Ozone Therapy in Pain Medicine

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SEOT
Sociedad Española de Ozonoterapia

WFOT

What is ozone therapy?

- The therapeutic use of medical ozone gas.
- Medical Ozone: ozone generated from medical oxygen at concentrations between 1 and 80 mcgr/mL.
- Where to buy:

Ozone Generator

Medical Device
II-b type

CE

Ozone therapy regulation?

- European directive 93/42 CEE:
  - For medical devices
  - Each country in EU develops its own law:
    - RD 1591/2009, de 16 de octubre, por el que se regulan los productos sanitarios (BOE 6/11/2009)

Ozone Generator

Medical Device
II-b type

CE

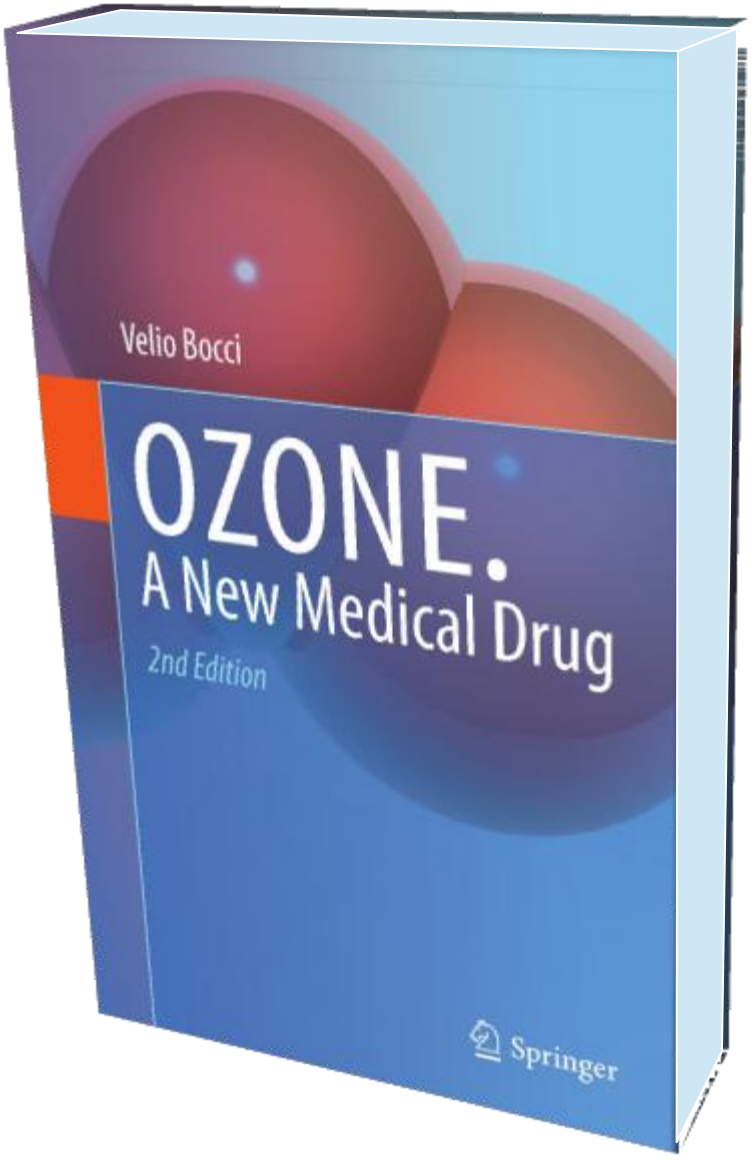
Ozone therapy regulation?

- Medical devices classification:
  - Type I (bandage):
    - Not invasive – selfevaluation
  - Type IIa (scalpel, ultrasound device):
    - Short time invasive without permanent effect on the body or fluids – External design evaluation
  - Type IIb (artificial implant, ozone generator):
    - Long time invasive and permanent effect on the body or fluids - External design evaluation and **Clinical Trials**
  - Type III (surgical absorbable suture):
    - Life risky or includes drugs – Previous design aproval, external evaluation and clinical trials

Is ozone therapy therapeutic?

- Decrease tissue inflammation:
  - PLA2 and COX2 inhibition
  - Modulation of pro-inflammatory cytokines (IL-1β, PgE2, TNFα, NO^-)
- Reduce oxidative stress:
  - Increase in antioxidants enzymes (Catalase, Glutation-peroxidase, SOD)
- Degradation of MPS in disc herniation:
  - Breakage of -SH=SH- (Fenton's reaction)
- Accelerates tissue healing:
  - Inhibits tissue degradation: MMPs
  - Stimulates tissue healing: PDGF, FGF

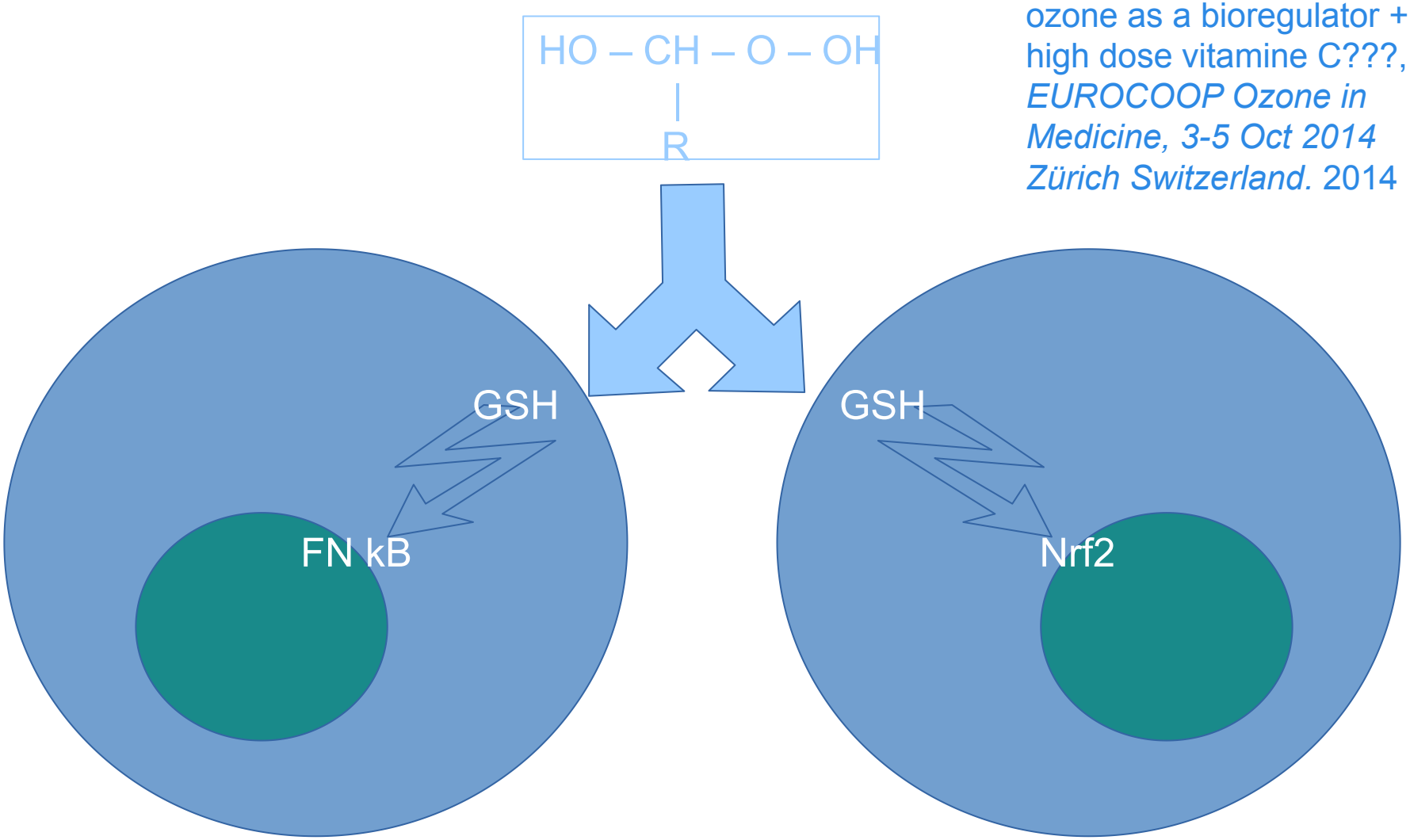
Is ozone therapy therapeutic?



2011

Is ozone therapy therapeutic?

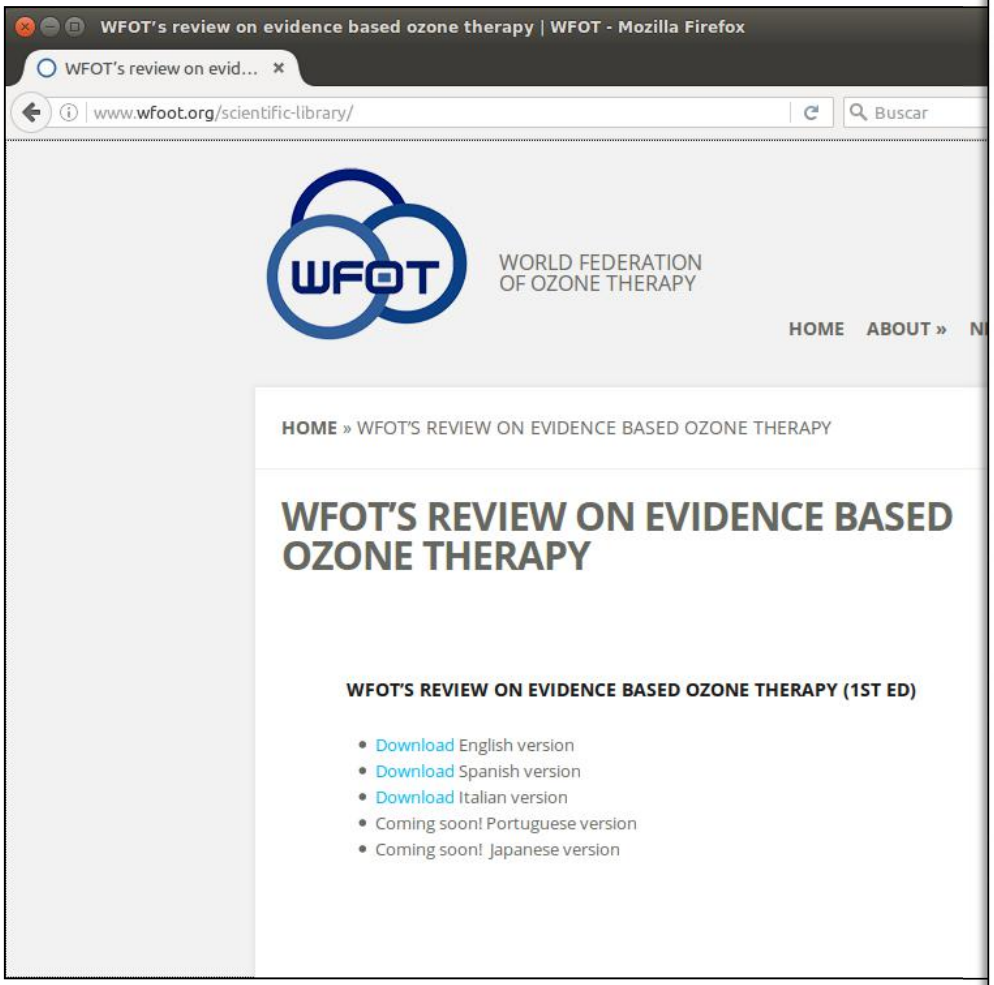
Viebhan R. Why low-dose ozone as a bioregulator + high dose vitamine C???, In: *EUROCOOP Ozone in Medicine, 3-5 Oct 2014 Zürich Switzerland.* 2014

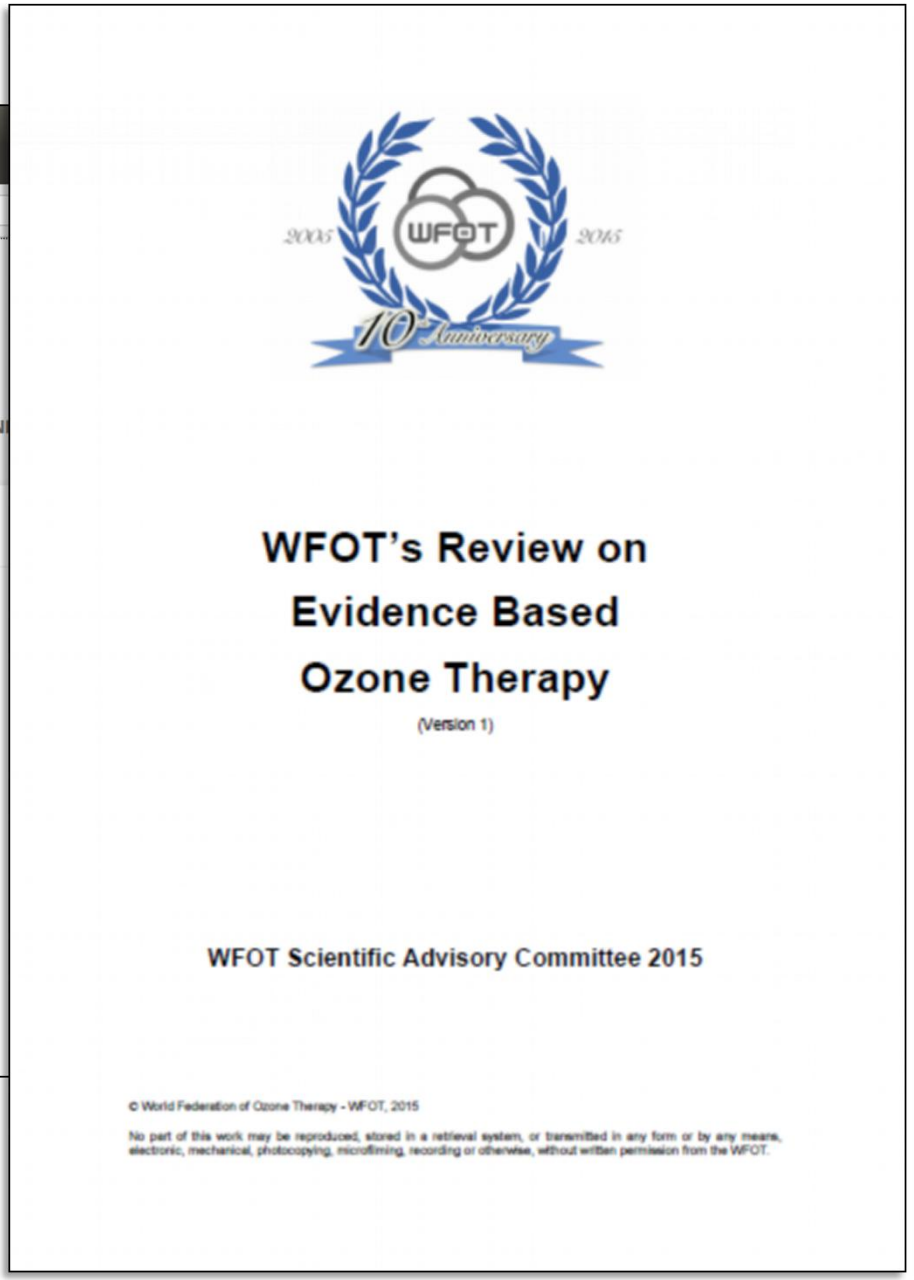


Inmunomodulación

Balance Redox

Is ozone therapy therapeutic?





SIGN guide 136 (NICE december 2013)

- LEVELS OF EVIDENCE
  - 1++ High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
  - 1+ Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias
  - 1 - Meta-analyses, systematic reviews, or RCTs with a high risk of bias
  - 2++
    - High quality systematic reviews of case control or cohort studies
    - High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that therelationship is causal
  - 2+ Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
  - 2 - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
  - 3 Non-analytic studies, eg case reports, case series
  - 4 Expert opinion

SIGN guide 136 (NICE december 2013)

- GRADES OF RECOMMENDATION
  - A
    - At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population;
    - or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
  - B
    - A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results;
    - or Extrapolated evidence from studies rated as 1++ or 1+
  - C
    - A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results;
    - or Extrapolated evidence from studies rated as 2++
  - D
    - Evidence level 3 or 4;
    - or Extrapolated evidence from studies rated as 2+

SIGN guide 136 (NICE december 2013)

- PHARMACOLOGICAL MANAGEMENT
  - B
    - Strong opioids should be considered as an option for pain relief for patients with chronic low back pain or osteoarthritis, and only continued if there is ongoing pain relief. Regular review is required.
  - D
    - Specialist referral or advice should be considered if there are concerns about rapid-dose escalation with continued unacceptable pain relief, or if >180 mg/day morphine equivalent dose is required.
- PSYCHOLOGICALLY BASED INTERVENTIONS
  - C
    - Referral to a pain management programme should be considered for patients with chronic pain.
- PHYSICAL THERAPIES
  - B
    - Exercise and exercise therapies, regardless of their form, are recommended in the management of patients with chronic pain.
  - A
    - Advice to stay active should be given in addition to exercise therapy for patients with chronic low back pain to improve disability in the long term. Advice alone is insufficient.

SIGN guide 136 (NICE december 2013)

- PHARMACOLOGICAL MANAGEMENT
  - Non-opioid analgesics (simple and topical)
    - NSAID B
    - Paracetamol C
    - Topical NSAID A
    - Topical Capsaicin A
    - Topical Lidocaine B
    - Opioids B
  - Anti-epilepsy drugs
    - Gapentine A
    - Pregabaline A
    - Carbamazepine B
  - Antidepressive
    - Tricycle A
    - Duloxetine A
    - Fluoxetine B
  - Combination therapy A (neuropathic pain)
  - Others
    - Botulin toxin not for pain

SIGN guide 136 (NICE december 2013)

- PSYCHOLOGICALLY BASED INTERVENTIONS
  - Pain management programs B
  - Education C
  - Behavioural therapies C
  - Cognitive therapies C
- PHYSICAL THERAPIES
  - Manual therapy B (spine)
  - Exercise B
  - Activity and excercise A (lumbar)
  - TENS B (spine)
  - Acupuncture B

IASP 2009 recommendation

- Steoids/anesthetic injections C (transforaminal) or null
- Termal Radiofrequency (RF) B
- Pulsed RF C

Spanish Foundation on Rheumatology

Medel Rebollo, J et al. Técnicas mínimamente invasivas en el tratamiento del dolor crónico. Fund Esp Reum. 2013; 14 (4)

- Steroids/anesthetic injections:
  - Transforaminal B
  - Facet C
  - Peripheral D (nerve) or null (myofascial syndrome)
- Termal RF B
- Pulsed RF C
- Neurostimulation D
- Pump/infussor A (short term) B (long term)

Pain unit

"Standards and recommendations for quality and safety"
Spanish Ministry of Health (2011)

Chronic pain; most frequent causes	
Musculoskeletal pain	Articular pain (arthritis) Spine pain Myofascial syndrome Oncologic musculoskeletal injuries
Neuropatic pain	Herpes zoster and post-herpetic neuralgia Peripheral neuralgia Diabetic neuropathy Complex regional pain Nerve injury Post-amputation pain
Mixed pain	Radicular pain due to spine diseases
Visceral pain	
Vascular pain	
Central pain	Fibromyalgia

Pain unit

"Standards and recommendations for quality and safety"
Spanish Ministry of Health (2011)

Chronic pain; most frequent causes	
Musculoskeletal pain	**Articular pain (arthritis) B** **Spine pain D** Myofascial syndrome Oncologic musculoskeletal injuries
Neuropatic pain	**Herpes zoster and post-herpetic neuralgia D** **Peripheral neuralgia D** **Diabetic neuropathy D** Complex regional pain Nerve injury Post-amputation pain
Mixed pain	**Radicular pain due to spine diseases B**
Visceral pain	
Vascular pain	
Central pain	**Fibromyalgia D**

Ozone therapy and pain

- Pribluda S. Tratamiento de la lumbociática y otros síndromes similares con ozono subcutáneo. Sem. Med. 1963; 123, 1026–1028.
- Verga C. Nuovo approccio terapeutico alle ernie e protusioni discali lombari. Rivista Di Neuroradiologia. 1989;(2):148.

> 270 papers

- 177 hernia discal lumbar
- 38 hernia discal cervical
- 37 gonartrosis
- 18 otras causas

- Perri M, Grattacaso G, di Tunno V, Marsecano C, Gennarelli A, Michelini G, et al. T2 shine-through phenomena in diffusion-weighted MR imaging of lumbar discs after oxygen-ozone discolysis: a randomized, double-blind trial with steroid and O2-O 3 discolysis versus steroid only. Radiol Med. 2015 Mar 6; doi:10.1007/s11547-015-0519-z

Ozone therapy and pain

Pag. 39/110

5.2 Cartera de servicios

Bloqueo Ganglio Walter
Ozonoterapia: infiltración y discólisis[31]
Bloqueo de nervios esplácnicos

[31] No existe evidencia científica suficiente sobre la eficacia de este procedimiento.

Radiofrecuencia
Ozonoterapia*
Epiduroscopia
Termografía
* Uso de Ozoterapia: no hay evidencia científica
Fuente: SED

Ozone therapy and lumboradicular pain

JVIR
Journal of Vascular and Interventional Radiology

ELSEVIER

J Vasc Interv Radiol 2010; 21:534–548

2010

A Metaanalysis of the Effectiveness and Safety of Ozone Treatments for Herniated Lumbar Discs

Jim Steppan, PhD, Thomas Meaders, BS, Mario Muto, MD, and Kieran J. Murphy, MD, FRCPC

PURPOSE: To determine statistically significant effects of oxygen/ozone treatment of herniated discs with respect to pain, function, and complication rate.

MATERIALS AND METHODS: Random-effects metaanalyses were used to estimate outcomes for oxygen/ozone treatment of herniated discs. A literature search provided relevant studies that were weighted by a study quality score. Separate metaanalyses were performed for visual analog scale (VAS), Oswestry Disability Index (ODI), and modified MacNab outcome scales, as well as for complication rate. Institutional review board approval was not required for this retrospective analysis.

Ozone therapy and lumboradicular pain

Pain Physician 2012; 15:E115-E129 • ISSN 2150-1149

Systematic Review

Ozone Therapy as a Treatment for Low Back Pain Secondary to Herniated Disc: A Systematic Review and Meta-analysis of Randomized Controlled Trials

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Dr. Dotta is with the Department of Surgery, Medical Sciences School, State University of Campinas - UNICAMP, Campinas, São Paulo.
Dr. Sasse, Dr. Teixeria and Dr. Fonoff are with the Pain Center and Division of Functional, Neurosurgery Institute of Psychiatry of Hospital das Clinicas, Department of Neurology - University of Sao Paulo Medical School, São Paulo, Brazil.

Address correspondence: Erich T. Fonoff, MD, PhD
Pain Center and Division of Functional Neurosurgery Institute of Psychiatry of Hospital das Clinicas
Department of Neurology - University of Sao Paulo Medical School

Background: Low back pain (LBP) is one of the most common and important health problems affecting the population worldwide and remains mostly unsolved. Ozone therapy has emerged as an additional treatment method. Questions persist concerning its clinical efficacy.

Objective: The purpose of our study was to evaluate the therapeutic results of percutaneous injection of ozone for low back pain secondary to disc herniation.

Study Design: A systematic review and meta-analysis of randomized controlled trials.

Methods: A comprehensive literature search was conducted using all electronic databases from 1966 through September 2011. The quality of individual articles was assessed based on the modified Cochrane review criteria for randomized trials and criteria from the Agency for Healthcare Research and Quality.

Outcome Parameters: The outcome measure was short-term pain relief of at least 6 months or long-term pain relief of more than 6 months.

Results: Eight observational studies were included in the systematic review and 4 randomized trials in the meta-analysis. The indicated level of evidence for long-term pain relief was II-3 for ozone therapy applied intradiscally and II-1 for ozone therapy applied paravertebrally. The grading of recommendation was 1C for intradiscal ozone therapy and 1B for paravertebral ozone therapy.

Ozone therapy and lumboradicular pain

OZONE THERAPY IN LOW BACK PAIN TREATMENT
SYSTEMATIC LITERATURE REVIEW
2013

CENTRO COCHRANE DO BRASIL

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ABSTRACT

Context: Low back pain is one of the most frequent and important problems affecting the world population, and its treatment is still controversial. Ozone therapy has emerged as a treatment method, but there are still doubts regarding its effectiveness and safety.

Objectives: To determine the effectiveness and safety of ozone therapy in non-specific low back pain and lumbosciatalgia treatment.

Methods: Systematic review, according to the Cochrane Collaboration methodology. We included only randomized clinical trials that tested the isolated or associated ozone therapy compared to placebo or other active treatments.

Conclusions: There is evidence of long-term superiority of ozone therapy for the treatment of chronic lumbosciatalgia when compared to steroid injection, radiofrequency and open surgery. Further studies are required with appropriate methodology and comparison of ozone therapy with placebo procedures, as well as studies comparing different ozone doses and application methods.

Recommendation level B

Ozone therapy and lumboradicular pain

- No indication:
  - Extra-articular
    - Oncologic
    - Refered
    - …..
  - Nonspecific low back pain:
    - “There is no such a thing named nonspecific low back pain, but nonspecific doctors” William Kirkadly Willis MD.OS.
    - Waiting for a clinical trial !!!

Ozone therapy and lumboradicular pain

- Indication:
  - Lumboradicular pain by disc herniation:
    - Not for calcified disc hernia
    - Not for progressive neurological deficit
    - Poorer results in foraminal herniation

    Recommendation level B

  - Low back pain by spondylolistesis grade I
    - Faliure of conservative treatment
    - Instead of steroids or RF

    (Bonetti M. 2003, 2005)

    Recommendation level D

Ozone therapy and lumboradicular pain

- Indication:
  - Low back pain by spondylosis:
    - Poorer result in case of scoliosis or spine instability
  - Low back pain by facet joint disease:
    - Poorer result in case of scoliosis or spine instability
  - Lumbar spinal stenosis:
    - Poorer result in case of scoliosis or spine instability

(Alexandre A. 2012, Andreula C. 2004, Baeza J. 2006, Bonetti M. 2002, 2006, 2007, 2011)

Recommendation level D

Ozone therapy and knee osteoarthritis

- *Moretti B., Lanzisera R., Morese A. [O2-O3 vs chondroprotectors in the treatment of osteoarthritis of the knee] Riv. It. Ossigeno-Ozonot. 2004; 3: 65-72*
- *Moretti, M. Effectiveness of Treatment with Oxygen-Ozone and Hyaluronic Acid in Osteoarthritis of the Knee. Int J Ozone Ther 2010; 9: 25–29*
- *Jesus, C, Trevisani, V, Santos F. Comparison Between Intra Articular Ozone and Placebo in the Treatment of Knee Osteoarthritis: A Multicentric, Comparative, Randomized and Double-Blinded Clinical Trial. ACR/ARHP Annual Meeting 2015*

Recommendation level B

Spine disorders: Techniques of treatment

- Injections:
  - Intradiscal (ID)[1]
  - Intraforaminal (IF)[2]
  - Facet joints (deep paravertebral) (DPV)[3]
  - Intramuscular (calssic paravertebral) (CPV)[4]
  - Intralessional – pars interarticularis[5]
  - Epidural:
    - Interlaminar[6]
    - Hiatus sacral[7]

Spine disorders: Techniques of treatment

1. Juncopilla N, Franzini M. The therapy involving the infiltration of oxygen-ozone intradisc and interfacet. 1er Congresso de la Sociedad Española de abordajes percutaneos vertebrales. Barcelona; 1995.
2. Muto M, Andreula C, Leonardi M. Treatment of herniated lumbar disc by intradiscal and intraforaminal oxygen-ozone (O2-O3) injection. J Neuroradiol. June 2004;31(3):183–9
3. Scuccimarra A. [The “Laminoforaminal Technique” in Oxygen-Ozone Therapy for Lumbar Disc Herniation]. Riv Ital Ossigeno-Ozonoterapia. 2003;2(2):193–6.
4. Verga C. Nuovo approccio terapeutico alle ernie e protusioni discali lombari. Rivista Di Neuroradiologia. 1989;(2):148.
5. Bonetti M. [CT-Guided Oxygen-Ozone Infiltration into Isthmic Lysis Points in the Management of 1st Degree Spondylolisthesis and Spondylolysis]. Riv Ital Ossigeno-Ozonoterapia. 2003;2(1):31–8.
6. Borrelli E. Mechanism of action of oxygen ozone therapy in the treatment of disc herniation and low back pain. Acta Neurochir Suppl. 2011;108:123-5. doi: 10.1007/978-3-211-99370-5_19.
7. Mattozi I, Laurini G, Muzzi G, Franzini M, Bigiotti A. Intrasacral epidural injection with oxygen-ozone for the treatment of low back pain. Comparison and evaluation with other techniques and rehabilitation and return to work. European Journal of Clinical Investigation. 2003;(33 (suppl. 1)):45.

Spine disorders: Techniques of treatment

- Indirect Endovenous Ozone therapy*:
  - Systemic ozone application
  - Withdraw 100-150 cc of peripheral venous blood and mix it with the same volume of ozone at 20 to 60 mcgr/mL concentration for 10 seconds
  - Remove the gas and infuse back the blood using a closed disposable system
  - 3 papers1-3 advice its use for:
    - Complementary treatment
    - Failure of treatment with injections

* Bocci V. Ozone: A new medical drug [Internet]. Netherlands: Springer; 2005. 295 pp. Retrieved from: http://www.springer.com/biomed/book/978-1-4020-3139-7

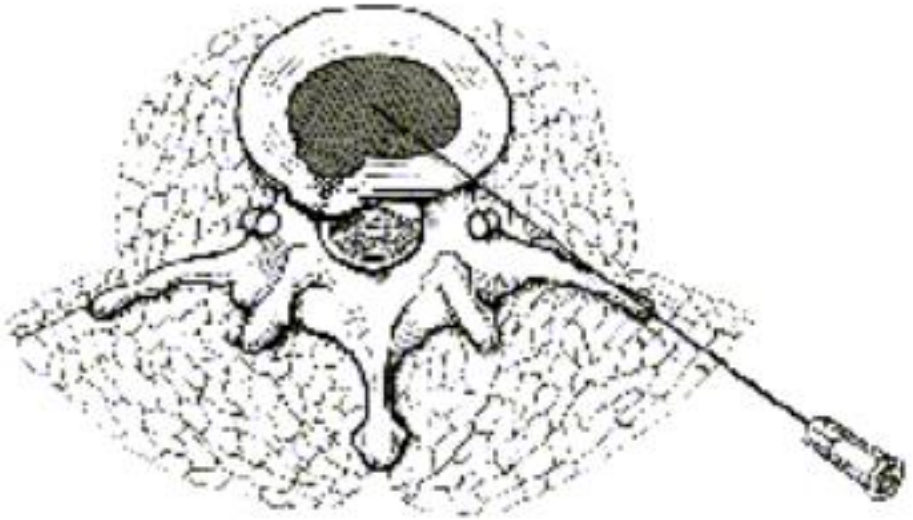
Spine disorders: Techniques of treatment

1. Alexandre A, Coró L, Paradiso R, Alexandre AM, Fraschini AL, Spaggiari PG. Treatment of symptomatic lumbar spinal degenerative pathologies by means of combined conservative biochemical treatments. Acta Neurochir 2011;108(Supl.):127-5.

2. Dall'aglio R, Gomez Moraleda M, Cardoso C, Alexandre A, Fraschini F. Biochemical and Pharmaceutical Aspects of Entrapment: the Possible Role of Free Radicals and Ozone in Nerve Root Compression. Riv Ital Ossigeno-Ozonoterapia. 2004;3(2):105–11.

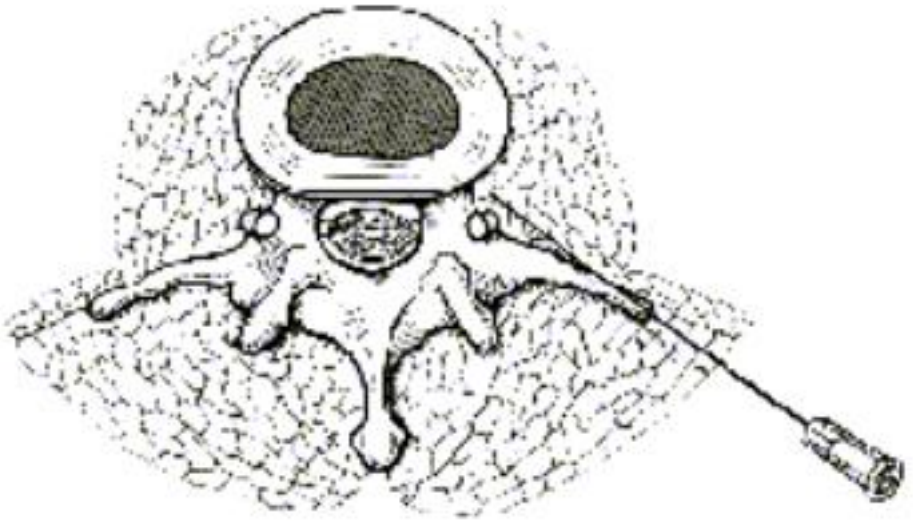
3. Calunga Fernández JL, Ramos Parra TL., Castillo P, Menéndez S, Carballo A, Céspedes J. Ozonoterapia combinada en el tratamiento del paciente portador de hernia discal lumbar: estudio preliminar. Rev Cubana Invest Bioméd [Internet].2007; 26(1). Available in: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-03002007000100003&lng=es.

Spine disorders: Techniques of treatment



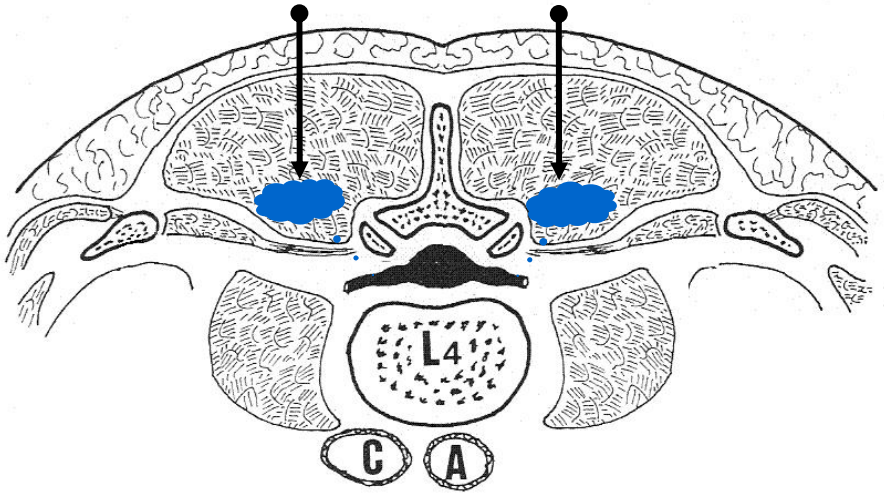
- 7-10 cm from spinous process
- Chiba needle (22G x 11”)
- Oblique 45º from medial line (20º caudal in L5-S1)
- 5 ml @ 30γ - 40γ

Spine disorders: Techniques of treatment



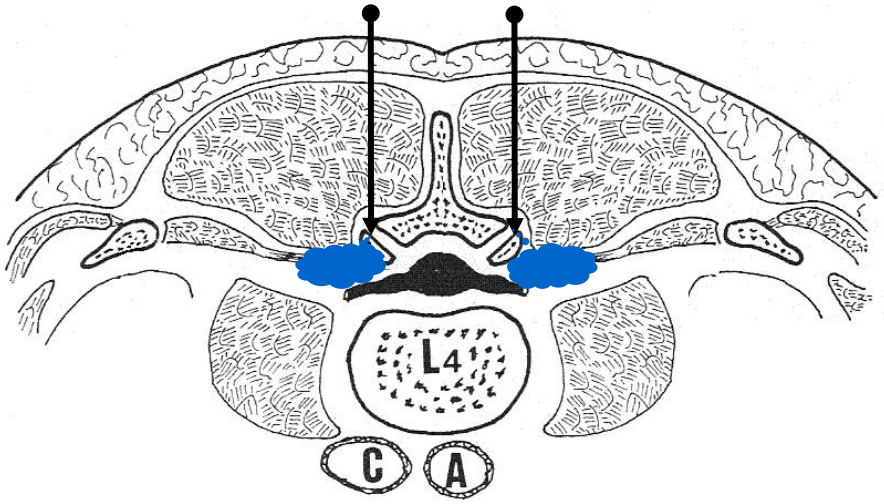
- 7-10 cm spinous process
- Chiba needle (22G x 11”)
- Oblique 45º from medial line (20º caudal in L5-S1)
- 10 ml @ 25γ

Spine disorders: Techniques of treatment



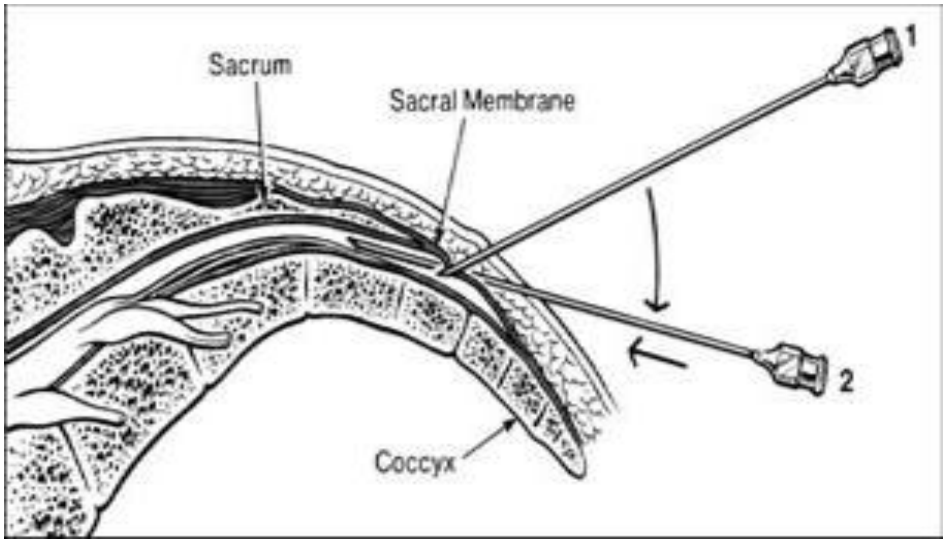
- 3-4 cm from spinous process
- 2 inj. in the superior vertebrae and 2 inj in the inferior vertebrae
- Intramuscular needle (18G x 40 mm)
- Perpendicular
- Intramuscular
- 5-10 ml @ 10-20 γ

Spine disorders: Techniques of treatment



- 2-3 cm spinous process
- Spinal needle (25G x 90 mm)
- Perpendicular
- Perifacetary / periforaminal
- 10 ml @ 20 γ

Spine disorders: Techniques of treatment



- Spinal needle (25G x 90 mm) + introductor
- Hiatus sacral
- Epidural
- 20 ml @ 20 γ

Treatment protocols

- Disc herniation*:
  - CPV: IB evidence level: positive results 70%
  - ID/IF: IC evidence level: positive results 80%

  - Indications**:
    - Failure of conservative meassures for 2 months
    - Symptoms and imaging correlation (TAC/RM)
    - Neurophysiological assesment if needed

* Magalhaes F., Dotta L., Sasse A., Teixera MJ., Fonoff ET. Ozone therapy as a treatment for low back pain secondary to herniated disc: a systematic review and meta-analysis of randomized controlled trials. Pain Physician. April 2012;15(2):E115–129.

** Murga M. [Ozone spinal infiltration. Indications, techniques and clinical experience]. Rev Esp Soc Dolor. 2005;12(II):10–7.

Treatment protocols

- Disc herniation*:
  - Radicular pain:
    - Contained/protruded hernia:
      - ID + IF in the same surgical act.
    - Extruded hernia:
      - ID (15 ml)
      - ID + IF in the same surgical act.
    - Emiigrated hernia:
      - IF a 1-2 levels (according to the level of emigration)
  - Low back pain (if present):
    - Facet joint disorder:
      - DPV
    - Muscular pain
      - CPV

*Alexandre A., Bricolo A, Millesi H. Advanced Peripheral Nerve Surgery and Minimal Invasive Spinal Surgery. Acta Neurochir. 2005; Supl. 2. 156 pp.

Treatment protocols

- Spondylotic low back pain[1-4]:
  - Bilateral DPV injection at each level +/- imaging help
- Facet joint low back pain[4]:
  - DPV injection around the facets +/- imaging help
- Lumbar spinal stenosis[2-5]:
  - IF or Sacral epidural injections
  - Add ID if there is a symptomatic LDH
  - DPV (bilateral) injection at each level for LBP

Treatment protocols

1. Bonetti M, Cotticelli B, Richelmi P, Valdenassi L. [Rofecoxib and O2-O3 Therapy vs O2-O3 Therapy in the Management of Spondylarthrosis]. Riv Ital Ossigeno-Ozonoterapia. 2002;1(2):171–8.

2. Bonetti M, Fontana A, Mardighian D. Oxygen-ozone therapy for degenerative spine disease in the elderly. Riv Ital Ossigeno-Ozonoterapia. 2006;5(1):25–32.

3. Bonetti M, Fontana A, Parodi F. Oxygen-Ozone Therapy Associated with Magnetic Bioresonance in Degenerative Arthrosis of the Spine: Preliminary Findings. Int J Ozone Ther. 2007;6(1):29–35.

4. Bonetti M, Fontana A, Martinelli F, Andreula C. Oxygen-ozone therapy for degenerative spine disease in the elderly: a prospective study. Acta Neurochir Suppl. 2011;108:137–42.

5. Baeza-Noci J. Spinal Ozone Therapy in Lumbar Spinal Stenosis. Int J Ozone Ther. 2007;6(1):17–24.

Side effects

- Marchetti O., La Monaca G. An unexpected death during oxygen-ozone therapy. Am. J. Forensic Med. Pathol. 2000. 21(2): 144-147
- Corea F., Amici, S., Murgia N. A case of vertebrobasilar stroke during oxygen-ozone therapy. J. Stroke Cerebrovasc. Dis. 2004, 13(6): 259-261
- Lo Giudice G., Valdi F., Gismondi M. Acute bilateral vitreo-retinal hemorrhages following oxygen-ozone therapy for lumbar disc herniation. Am. J. Ophtalmol. 2004, 138: 175-177
- Zambello A., Bianchi M., Bruno F. Safety in ozone therapy. Riv. It. Ossigeno-Ozonot. 2004, 3: 25-35
- Scarchilli A., Malpieri R. Meningeal irritatation after paravertebral oxygen-ozone injections. A case report. Riv. It. Ossigeno-Ozonot. 2004, 3: 35-36
- Gianneschi F., Cervelli C., Milani P. Ventral an dorsal root injury after oxygen-ozone therapy for lumbar disc herniation. Surg. Neurol. 2006, 66: 619-621
- Pellicano G., Martinelli F., Tavanti V. The Italian Oxigen-Ozone Therapy Federation (FIO) study on Oxygen-Ozone Treatment of herniated disc. Int. J. Ozone Therapy, 2007, 6: 7-15
- Bo W, Longyi C, Jian T, Guangfu H, Hailong F, Weidong L, et al. A pyogenic discitis at c3-c4 with associated ventral epidural abscess involving c1-c4 after intradiscal oxygen-ozone chemonucleolysis: a case report. Spine. April 15, 2009;34(8):E298–304.

Conclusions

- Ozone therapy is safe and effective to treat lumbosciatic pain due to lumbar disc herniation.
- There are some evidence that it can be useful to treat other spines diseases
- There is strong evidence that it can be safe and effective to treat knee osteoarthritis.
- There are some evidence about its use in other painful situations (FM, TMJD, Neuralgias, ...)

THANK YOU!

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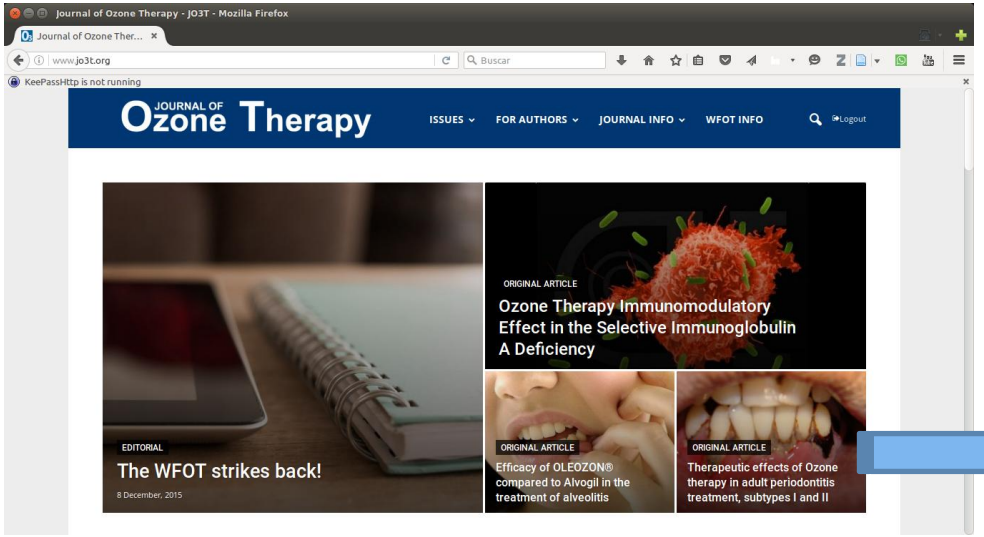

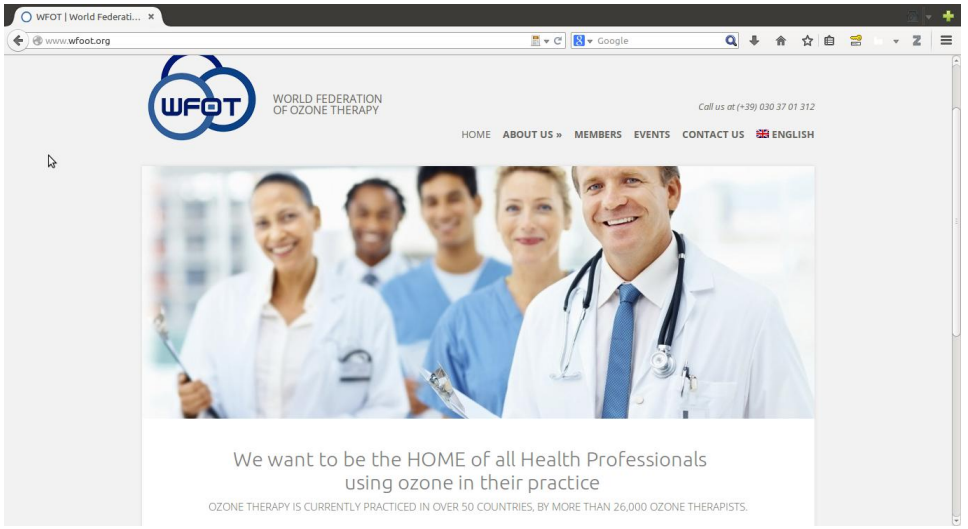

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ORIGINAL ARTICLE

Therapeutic effects of Ozone therapy in adult periodontitis treatment, subtypes I and II.

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ABSTRACT

Introduction: Conventional treatments of the periodontitis rely on surgery and antibioticotherapy. The properties of the ozone offer a more innocuous and more economic new alternative therapeutic.
Objective: to evaluate the effectiveness of the ozone therapy in the treatment of periodontitis type I and II, and to identify the adverse events
Methods: It was carried out a clinical trial, phase III, randomized, controlled and to simple blind in patients that went to Odontological Clinic "III Congress of PCC" of Matanzas, January 2013 - January 2015. The sample belonged to 50 patients, divided in 5 groups of 10 patients each one: Group A - Treaties with ozone gas. Group B - OLEOZON®. Group C – ozonized water. Group D - treatment of ozone combined with the three modalities (gas, ozonized water and OLEOZON®. Group Z (control) - conventional treatment. The groups A, B, C and D were the experimental groups. Clinic and microbiological evaluation was measures. Effectiveness of the treatment, and adverse events were evaluated. The results showed up in graphics, the percentage and Square Chi were used. The ethical principles were completed.
Results: Clinical evaluation went satisfactory to the month of the treatment in 84,6% of the studied places, with better results in the group D (96%), with significant differences between the experimental groups and the control. The microbiological evaluation was satisfactory and increased to 85,4% to the six months of the study. The experimental group D prevailed (96,6%). The effectiveness was good in 85,4% of the sample, prevailing in the experimental group D with 96,6%, followed by the group A. The percentage of adverse events was low, 1,5%.
Conclusions: The clinical and microbiological evaluation showed satisfactory results, associated to a low percentage of adverse events (with gas ozone only). The combined ozone therapy was the most effective treatment for this type of periodontitis.

Key words: ozone therapy, treatment, periodontitis

INTRODUCTION

Advances in medicine as a science, in the world, have incorporated knowledge and practices, whose results evidence to be of high value for development and progress of humanity[1].

Among contemporary medicine trends stands out, with an increasing dynamism in recent years, incorporation of natural and traditional medicine to professional practice, not as an alternative method but as true discipline which is necessary to constantly study, improve and develop, due to its proven ethical and scientific advantages.

This medicine, internationally known as alternative, energetic, natural, complementary or holistic is a reality made present in the whole world and is part of each country's cultural heritage. It uses practices that have varied from country to country and generation after generation, for hundreds of years before development of current conventional medicine.