

original paper

Ozone therapy, a supplement for patients with fibromyalgia

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Keywords

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Abstract

Fibromyalgia is a disease of unknown cause whose main symptom is chronic widespread musculoskeletal pain accompanied by symptoms that disrupt daily activities of patients. In this study the impact of ozone therapy in improving patients' pain and daily activities to give them a better quality of life was assessed. Clinical experience is described using ozone therapy in 30 women aged 30-65 years diagnosed with Fibromyalgia, Visual Analogue Scale (VAS) 6-9, with a time of disease progression between 1-10 years. Patients were treated with O₂-O₃ intramuscular with 10 sessions 2 times a week at doses of 15 mg / mL, together were administered systemically 10 sessions 2 times a week alternating rectal insufflation and intravenous administration of saline 0.9% ozonated. The outcome of patients was continued by monitoring clinical symptoms and evaluation of the Visual Analogue Scale.

The results showed an improvement in pain with 33% VAS 3-4 in the second week, improved sleep disorder in 46.6%, mood and daily activities by 40% and appreciated a decrease in the amount of drugs consumed by 30% of patients.

The ozone therapy can be considered as an interesting as adjuvant therapy in the symptoms of fibromyalgia.

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INTRODUCTION:

Fibromyalgia is characterized by an increase in pain perception in the central nervous system, whose main symptom is chronic widespread pain at muscles, tendons and ligaments, but not in joints; It's prevalence is higher in women than in men. Has an unknown etiology, but there are several hypotheses about such as:

Inheritance first degree consanguinity, pregnancy with severe stress after infection, trauma or inflammation because these situations may increase pain signals at the level of muscles and nerves and instead of returning to normal after the above conditions these nerves sensitized are causing changes in the SNC becoming more sensitive or highly excitable; pregnancy continued severe stress altered secretion of cortisol. ^{1,4,6}

-Other investigation has shown gene disorders COMT (catechol-O-methyltransferase) which generates disturbances catecholamine receptors (dopamine, epinephrine, and norepinephrine) in the central nervous system and in the limbic system. ³

-Decreased levels of serotonin and tryptophan that are each responsible for the regulation of nerve impulses, remember that serotonin plays an important role in pain, depression, sleep and eating behaviors. ⁸

Therefore the levels of serotonin in patients with fibromyalgia partly explain why pain, sleep disorders and the onset of migraines.

-Impaired oxygenation in the motor plate.

-Impaired microcirculation.

- Increased pain producing substances such as substance P.

- Changes in interleukin where we find: Increased IL-6 and decreased IL-10, remember that IL6 is related to persistent pain states and fatigue and IL10 with inflammatory and immunomodulatory activity. ^{2,6}

It's diagnosis is based on clinical examination, since all radiological and laboratory tests are normal. As established by the American College of Rheumatology must meet the major criteria and 3 minor criteria.

**Compulsory criteria

- 1.Chronic widespread musculoskeletal pain for 3 months or more.
- 2.Absence of secondary causes. (Endocrine, tumor, rheumatic) diseases.
- 3.Triggers pain trigger points.

**Minor criteria (must comply 3 of these):

1. Excessive fatigue to the level of activity undertaken.
2. Sleep disorders.
3. Subjective sensation of joint swelling and morning stiffness.

4. Modulation of symptoms with atmospheric changes.
5. Increased anxiety or stress symptoms.
6. Headaches, dizziness.
7. Colon disorders.
8. Genitourinary problems.
9. Depression.

Today it is considered that the criteria for making the diagnosis may be under FIQ (Fibromyalgia Impact Questionnaire) which are divided into Mild responds to symptomatic treatments and performs well in their work. Moderate: having trouble in 1st 2 aspects of everyday life (workplace, self-esteem, and interpersonal relationships when difficulties arise from lack of understanding) and Severa: stop being active and productive workforce.

PROGNOSTIC AND TREATMENT:

Is not removed, there is no definitive cure worse people evolve NO exercise, take many medications, have psychiatric disorder and unmotivated patients. ^{7,8}

TREATMENT consists in giving quality of life by providing medicines to improve pain, sleep, make gradual exercise, and teach them to have proper management of breath, psychological treatment and taking antioxidants.

The objective of this study was to evaluate the impact of ozone therapy in improving pain in patients with fibromyalgia and how it can affect daily activities to give them a better quality of life.

MATERIALS AND METHODS:

30 female patients seen in consultation were studied between January 2007 - January 2009 and sent them by specialists referred by other patients, which reached diagnosed with fibromyalgia, however in income took into account the major and minor criteria.

An observational, longitudinal study was not blinded, non-randomized.

The variables that were considered were: sex, age, duration of fibromyalgia, visited specialties, use of medications, pain intensity (VAS), depression, sleep disorders and daily activities.

Regarding Gender found that 30 patients were women.

Age was distributed by groups where the range was between 30-65 years, finding that 70% were older than 40 years.

The time evolution of Fibromyalgia according to age was between 1-10 years, where we found that 9 patients were younger than 40 wore these for 1-5 years with fibromyalgia, 21 patients

were older than 40 years and had been with disease range between 6-10 years ago this was Fisher's test where it is highly significant and we see that patients older than 40 years tend to further evolution of fibromyalgia than younger patients.

In the visited specialties found that fibromyalgia patients 100% had attended a psychiatrist, 83.3% for internal medicine, rheumatology 83.3%, 10% to neurology and 4 % orthopedics.

All patients were assessed the intensity of pain by visual analog scale (VAS), which allows us to reassess the pain in the same patient and make an initial assessment and then check the effect of the treatment administered. You consider ranging from 0-10 where 0 is no pain and 10 being the most pain.

Sleep Disorders evaluated were conciliation maintenance insomnia and terminal insomnia. In everyday activities took into account those daily chores like washing a house, organizing, cooking and personal care such as getting up, bathing, grooming.

Considering that a high percentage of fibromyalgia patients have depression (8) were asked to all Hamilton test before starting treatment with O₂-O₃ and finish the 10 sessions of ozone therapy.

On the consumption of antidepressant medication were taking Fluoxetine 10 patients (33.3%), duloxetine 3 patients (10%), Amitriptyline 4 patients (13.3%), sertraline 8 patients (26.7%), 5 patients Venlafaxine (16.7%) had several patients taking antidepressants.

Among those taking medications for pain found pregabalin, acetaminophen, acetaminophen with codeine, Dipyron, Naproxen, Nimesulide, Piroxicam, Ibuprofen, which were consumed with a frequency between 1-4 times per day, many patients taking multiple medications at once.

It carried out a scheme with ozone therapy for 5 weeks where they placed 2 times weekly intramuscular (IM) at a concentration of 3 ml 15mcg/ml each trigger point and 2 times weekly were placed systemically alternating 1 to insufflation rectally 15mcg/ml concentration to a volume of 140cc, and 1 time per week is placed in Intravenous 250cc 0.9% saline at a concentration of ozonized for 20 min 5mcg/ml.

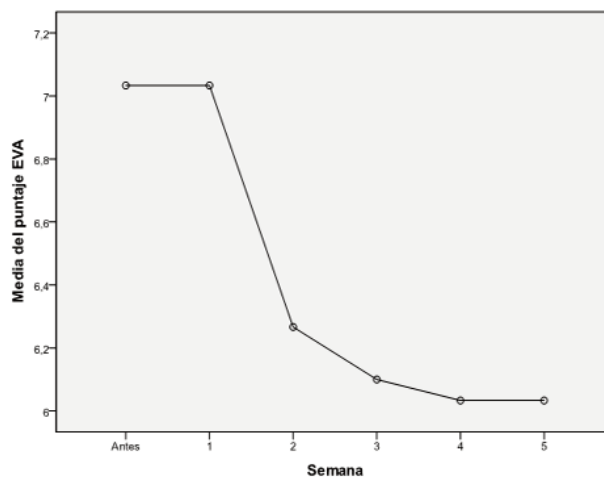
RESULTS:

As fibromyalgia a disease that causes multiple symptoms makes patients come for help to many specialties and sometimes looking for a correct diagnosis, because it can be confused with other diseases such as myofascial syndrome, chronic fatigue syndrome etc. (4.6) we realize that fibromyalgia patients consult multiple specialists where everyone ever attended the psychiatrist and the vast majority had gone to rheumatology and internal medicine.

Distribution of pain in fibromyalgia patients was analyzed before applying O₂-O₃ and found that 2 patients (6.6%) had VAS 9, 6 patients (20%) VAS 8, 9pacientes (30%) 6 and 13 patients (43.3%) had VAS on 7.

Then he began to apply O2-O3 and monitoring pain became each week evaluating the VAS for each patient, meeting the second week of application of ozone therapy improvement in pain by VAS in 10 patients (33%) where 2 patients VAS which had passed on June 3, 4 having the VAS Decrease in 6 to 4 and 13 having the VAS at 7 in the second week 4 decreased the VAS. By the third week it was observed that 2 of the 6 patients who had the EVA Decrease 8 to 7 and 1 of which had the VAS Decrease 9 to 7. During the fourth and fifth week, no further reduction of pain in any other patient and pain intensity in which it had fallen remained decreased is not present.

The mean score during the VAS study was a 6 (Graphic 1) and the distribution of patients according to response to the O2-O3 was 13 patients responded equates to a 43.3% and 17 (56.7%) patients did not respond Friedman test are made and is highly significant (Graphic 2).

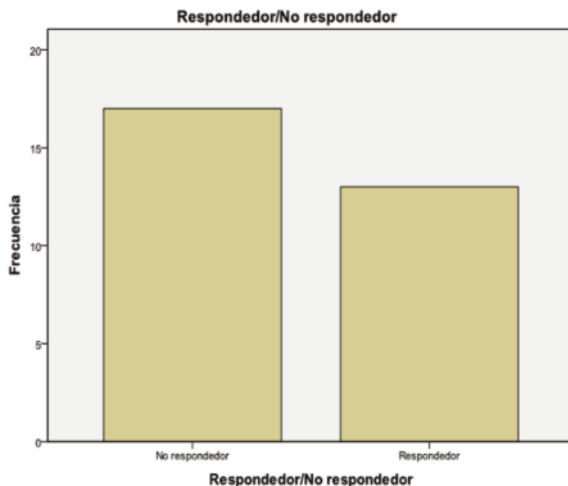


Graphic 1. MEDIA DISTRIBUTION OF PAIN DURING THE STUDY.

MEASURE_1

Week	Media	Error tıp.	Confidence interval 95%	
			Lower Limit	Upper Limit
Before	7,033	,162	6,701	7,366
1	7,033	,162	6,701	7,366
2	6,267	,332	5,588	6,946
3	6,100	,308	5,469	6,731
4	6,033	,316	5,387	6,680
5	6,033	,316	5,387	6,680

Graphic 2. DISTRIBUTION OF PATIENTS ACCORDING TO RESPONSE TO OZONETHERAPY



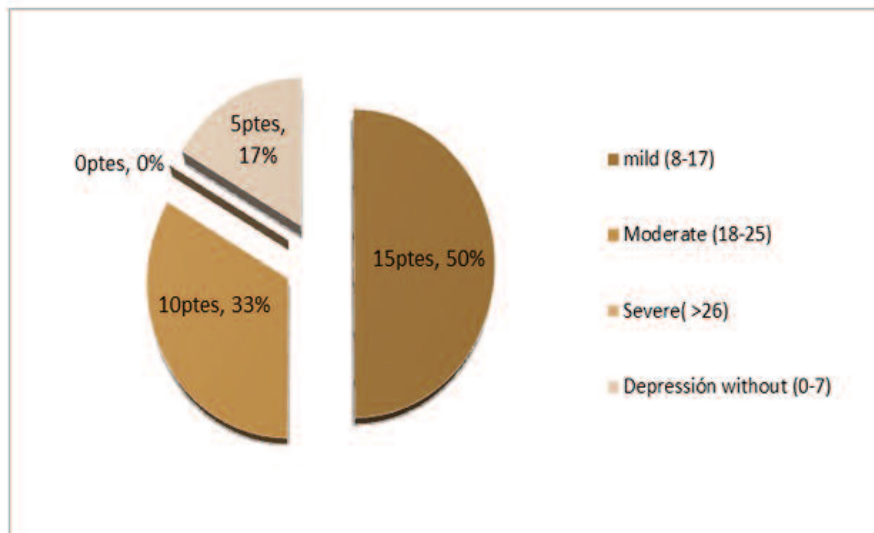
Highly significant by Friedman test $p = 0.00001$

Highly significant by Friedman test $p = 0.00001$

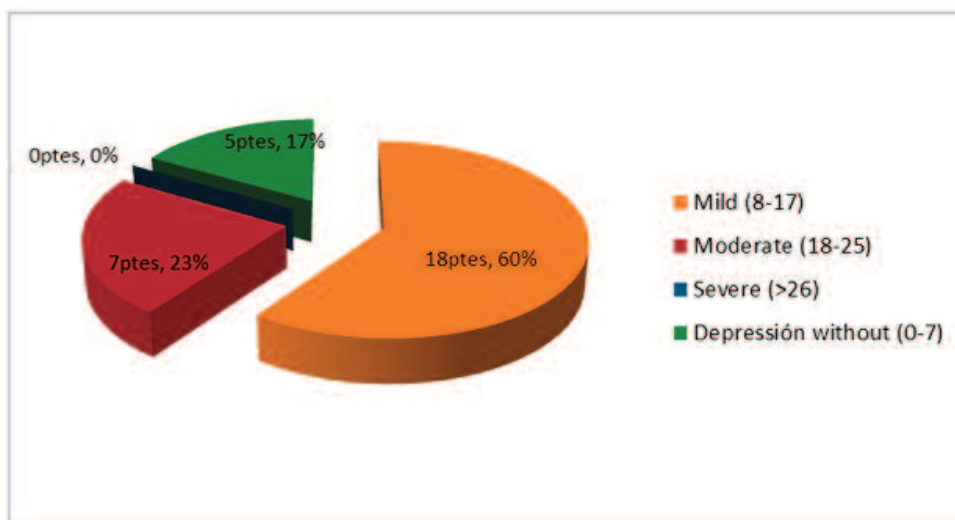
		Frecuency	Percentage	Valid percentage	Cumulative percentage
Valid	No answer	17	56,7	56,7	56,7
	Answer	13	43,3	43,3	100,0
	Total	30	100,0	100,0	

Were asked on the first date the Rating Scale Hamilton finding that 50% of patients had mild depression, 33% had moderate depression, 17% had no depression and no patient was in severe depression (Graphic 3); drugs who were taking antidepressants were to enter Fluoxetine 10 patients (33.3%), Duloxetine 3 patients (10%), Amitriptyline 4 patients (13.3%), sertraline 8 patients (26.7%), Venlafaxine 5 patients (16.7%) patients were taking multiple antidepressants. After performing the 10 sessions of ozone therapy find it again Hamilton Scale where we note that 3 patients increased from mild to moderate depression (Graphic 4), which means that 10% of patients showed improvement in their psychiatric illness, these patients were not modified its antidepressant treatment, but were sent to the specialist psychiatrist to decide if changing the dose.

Graphic 3. DEPRESSION IN PATIENTS WITH FIBROMYALGIA BEFORE OZONETHERAPY (Hamilton Rating Scale)



Graphic 4. DEPRESSION IN PATIENTS WITH FIBROMYALGIA AFTER THE OZONE THERAPY (Hamilton Rating Scale)



Patients were receiving multiple medications of different types to help manage pain (Table 1), apply after O2-O3 was obtained from 13 patients who had decreased their pain 4 continued with the same dose and 9 patients had lower achievement medications (Table 2), he makes the Fisher test is highly significant and, therefore fibromyalgia patients is more likely to decrease medications that patients who do not respond.

Table 1. USE PAIN MEDICATION FOR PATIENTS WITH FIBROMYALGIA

Medicamentos	n/ %
Pregabalin	15 (50%)
Acetaminophen	15 (50%)
Acetaminophen -codeine	8 (26,7%)
Dipyrone	2 (6,7%)
Naproxen	4 (13.3%)
Nimesulide	2 (6,7%)
Piroxicam	2 (6,7%)
Ibuprofen	7 (23,3%)

Table 2. DECREASE OF DRUGS BY RESPONSE TO OZONE THERAPY

ANSWER WITH OZONOTHERAPY			
Drugs	NR	R	TOTAL
Equal	17 (56.6%)	4 (13.3%)	21
Decrease	0	9 (30%)	9
TOTAL	17 (56.6%)	13 (33,3%)	30

NR: No responder R: Responder

Highly significant by Fisher p = 0.00001

During treatment the different sleep disorder were evaluated before and during application of O2-O3 mixture evidenced in patients who had initially presented simultaneously difficulty reconciling 14 (46.6%) and sleep maintenance 14 (46.6%), only 6 patients (20%) had insomnia

terminal 20 (33%) and 20 (33%) had no disorder. To apply ozone therapy, results showed that between 4-6 6pacientes meeting we were off balance disorder, 4-10 8 patients reported improvement in active maintenance insomnia, thus obtaining an improvement in sleep disorders in 14 (46.6%) patients.

Everyday activities at home and personal care were assessed through a survey which asked if they generated fatigue or weakness carry them out or if they stopped making them for pain, which was obtained before treatment 20 patients reported fatigue or weakness in the activities who performed at home and personal care 25 patients, 10 patients stopped doing things for house and 5 pain stopped grooming, arising or take a bath for the pain that causes their disease after treatment ends are asked the same questions and 7 patients had no experience fatigue or weakness and 5 patients of the 10 who stopped doing things for pain and activities performed at home which is equivalent to a total of 12 (40%) patients reporting improve in their daily activities; respect to personal care 12 (40%) patients stopped referring fatigue or weakness, while they concerned that their mood had improved to see what they could and get things done that were not previously felt able to make the fatigue that had to place them before the O2-O3 mixture.

At work, it was found that of the 13 patients who reported decrease the time spent on the job for four pain (13.3%) and optimized their time and the 6 patients who did not work for Pain 2 (6.7%) were admitted to their jobs again.

DISCUSSION AND CONCLUSIONS

Given that fibromyalgia is a disease that causes severe limitations and creates a poor quality of life for patients by having multiple symptoms due to their various hypotheses of origin 2,3,6,8 Is achieved is beneficial to understand how the mechanism of action of the ozone in this pathology and by reducing the production of mediators of inflammation pain decreases, also achieves Ozone glycolysis speed up by activating the mitochondrial respiratory chain 14,15 to place them why ozone therapy to patients an improvement in pain was evident from the second week of applying a 33% completing treatment and the total was 43.3%, which was highly significant. When achieved lower pain intensity, it was observed a decrease in the consumption of drugs for pain management in 30% of patients.

The O2-O3 mixture to enhance serotonin production, increase the efficiency of the antioxidant enzyme system and microcirculation will generate an increase in oxygenation level and the motor plate will enhance the production of endorphins, so patients with fibromyalgia treated with ozone therapy were able to improve their sleep disorders in 46, 6% and daily activities by 40%.

The ozone therapy can be considered as an interesting as adjuvant therapy in the symptoms of fibromyalgia.

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