

# Ozone Oil: The Marvel Oil for Temporomandibular Joint Disorders

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## Abstract

Each day is an adventure in the medical and dental world. Every second an idea is spurred and within days an innovation takes birth. One such miracle is "Ozone Oil;" relatively new but containing immense potential in relieving pain in temporomandibular joint (TMJ) pain disorders. Ozone oil therapy is a non-pharmacological treatment protocol that has as anti-inflammatory and analgesic effects over the TMJ joint. These properties of ozone are attributed to its ability to oxidize the double bound compounds as arachidonic acid involved the inflammation process, thereby alleviating the pain. Here, we present two case reports of patients clinically diagnosed with the TMJ pain, (as per the research diagnostic criteria) and considered as transition-minimized differential signaling. After thorough investigations were done and later patient was subjected to the treatment with ozone oil therapy, as an innovative and non-invasive approach. The results showed as tremendous improvement in tenderness of masticatory muscles and on the pain (visual analog scale [VAS] scale) was found in both the patients. We concluded that ozone oil therapy because of its non-invasiveness, easy application and promising results could prove to be an innovative approach in treating the TMJ pain (musculoskeletal) disorders.

**Key words:** Orofacial pain, Ozone oil, Research diagnostic criteria, Temporomandibular joint disorder, Therapeutic ultrasound massage therapy, Transcutaneous electrical nerve stimulation, Visual analog scale

## INTRODUCTION

Orofacial pain is one of the most commonly attended chronic disorders in a dental set up. However, as common as it is, its diagnosis and treatment are equally daunting. Among diverse types of orofacial pain, one of the most common is the temporomandibular pain.

Temporomandibular pain disorder is impacted by multiple parameters such as stress, emotional disturbances, malocclusion, and hyperactivity of masticatory muscles, along with interplay of predisposing and perpetuating components.

Due to the complex nature of temporomandibular joint (TMJ) disorders, the diagnosis becomes challenging

for the clinician. Therefore, a thorough knowledge and understanding of this disease process becomes essential to dispense appropriate treatment to the patient.

Over the years, wide range of treatment modalities has been utilized to render relief from the disturbing pain of TMJ, including pharmacological methods, behavioral corrections, orthodontic corrections, and physical therapies as transcutaneous electrical nerve stimulation and therapeutic ultrasound massage therapy.<sup>[1]</sup>

Recently, a new entity is being acknowledged in the field of TMJ Disorders, that is, the ozone oil. Being a non-invasive modality, it could be a boon to the patients and clinicians dealing with the temporomandibular pain.

## Ozone Oil

The history of ozone therapy in medical literature dates back to the 19<sup>th</sup> century. Dutch physicist Martin van Marun in 1785, made its first mention. However, the formulation of ozone by the oxygen gas was first demonstrated by Christian Friedrich Schonbein in 1840, a Professor in University of Basel.<sup>[2]</sup> He also introduced

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www.ijss-sn.com

Month of Submission : 07-2020  
Month of Peer Review : 08-2020  
Month of Acceptance : 09-2020  
Month of Publishing : 09-2020

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the world to the Greek work, “OZEIN,” meaning odor.<sup>[3,4]</sup>

Since years, ozone is being used in the form of gas, water, and oil in various fields of medical and dental science. The pharmacological benefits of ozone are attributed to its anti-inflammatory and analgesic effects.

Anti-inflammatory action is because of its potential to oxidize double bond compounds of arachidonic acid and other derivatives present at the inflammatory sites, thus resolving the pH. Plus, it oxidizes the product of albuminolysis produced at the nerve ending, therefore, manifesting its analgesic trait.<sup>[5,6]</sup>

In the history of its application in the field of dentistry, the ozone has been utilized only in the form of gas and water. Even in treating the TMJ disorder, the literature reveals its application mostly in the water form.<sup>[7,8]</sup> The administration of ozone oil has been limited to the dermatological and cosmetology purposes.<sup>[9]</sup> From the reviewed literature, it was found that there are only few mentions in regard to the application of ozone oil as a treatment modality for TMJ disorder (Musculoskeletal group).<sup>[10]</sup>

Therefore, as an innovative approach, an attempt was made to study the effectiveness of ozone oil as a treatment modality for TMJ disorders.

## CASE REPORTS

### Case Report 1

A 30-year-old male patient reported to the Department of Oral Medicine and Radiology, Teerthanker Mahaveer Dental College and Research Centre, with the chief complaint of pain on the left side of the face in the preauricular region since 5 years. The history of present illness was revealed as pain is of dull continuous nature that aggravated on chewing, especially hard food stuff and relieved by analgesics. The pain radiated to the temporal and facial region of left side involving the TMJ region. There was no contributory medical and dental histories were noncontributory.

However, personal history mentioned the habit of occasional tobacco chewing (3 packs/weeks, since 10 years). Extra-oral examination revealed tenderness over temporal muscle. No significant deviation on jaw opening or closing was present. On the intra-oral examination, oral hygiene was compromised with no mucosal changes were noted. However, on intra-oral palpation of the left lateral pterygoid is also tender on left side. The pain score was recorded according to the visual analog scale (VAS) scale.

These measurements were tabulated and entered into the preformed given [Tables 1 and 2]. It was provisionally diagnosed as myofascial pain dysfunction syndrome (MPDS) of the left lateral pterygoid and left temporal muscle was given.

The diagnosis was made according to the Research Diagnostic Criteria, given by Leresche *et al.* 1992.<sup>[11]</sup>

### Case Report 2

A 42-year-old female reported to the Department of Oral Medicine and Radiology, Teerthanker Mahaveer Dental College and Research Centre, Moradabad, with the chief complaint of pain on right side of her face since 2 years. She also complained of difficulty in mouth opening since a year. On history of present illness, the patient had continuous dull ache that aggravated on talking and chewing.

She gave history of extraction in her lower right back tooth region 3 years back which was uneventful. No other contributory history was given. On extra-oral examination, her mouth opening was reduced along with tenderness over the right temporalis and masseter muscles. No deviation on mouth opening was noticed.

On intra-oral examination, her oral hygiene was seen to be compromised. 16, 22, 26, 46, and 47 were found to be missing and lateral pterygoid muscle is tender on palpation on right side. The tenderness was graded as mild, moderate, and severe. The pain score was recorded according to the VAS scale and entered the measurements in the pro forma given [Tables 1 and 2].

On the basis of the history given by the patient and clinical examination done, a diagnosis of MPDS of right temporalis and masseter was given.

### Treatment

Both the patients were advised to initiate the ozone oil therapy.

### Method of Application

Patient was asked to take the oil in pea-drop concentration and apply over the affected area, 3 times a day.

Patients were recalled after 5 days for five subsequent visits.

Massaging of oil was prohibited.

In addition to the ozone oil application:

First Patient: Habit counseling was done and he was referred to the department of periodontics for oral prophylaxis.

**Table 1: Tenderness table**

Cases	Visits	Tenderness and pain chart							
		Masseter		Temporalis		Lateral pterygoid		Medial pterygoid	
		Right	Left	Right	Left	Right	Left	Right	Left
Case 1	1 <sup>st</sup> visit				Severe		Severe		
	2 <sup>nd</sup> visit				Moderate		Severe		
	3 <sup>rd</sup> visit				Moderate		Moderate		
	4 <sup>th</sup> visit				Mild		Mild		
	5 <sup>th</sup> visit				No pain		No Pain		
Case 2	1 <sup>st</sup> visit	Moderate		Severe					
	2 <sup>nd</sup> visit	Mild		Moderate					
	3 <sup>rd</sup> visit	Mild		Mild					
	4 <sup>th</sup> visit	Mild		Mild					
	5 <sup>th</sup> visit	No Pain		No Pain					

**Table 2: Pain table**

	1 <sup>st</sup> visit	2 <sup>nd</sup> visit	3 <sup>rd</sup> visit	4 <sup>th</sup> visit	5 <sup>th</sup> visit
Case 1	8	7	5	2	0
Case 2	7	5	3	1	0

Second Patient: It was referred to the department of periodontics for oral prophylaxis and department of prosthodontics for replacement of missing teeth.

## DISCUSSION

Both these cases were clinically diagnosed as MPDS, which is musculoskeletal disorder in the broad spectrum of TMJ disorder. The diagnosis was based on the research diagnostic criteria.

Both the patients were referred for the oral prophylaxis and in the case of second patient; habit counseling was done in the first case and in the second case, patient was also referred for tooth replacement, as chronic tobacco chewing and missing teeth could be a contributing factor in history of chronic pain respectively.

As the main treatment protocol, both were advised to apply ozone oil in the instructed manner for a period of almost 1 month. In this duration, patient was recalled for visits, and tenderness and pain were recorded in the given chart.

It was observed that in the second visit itself, tenderness and pain were significantly reduced, except in the case of tenderness in left lateral pterygoid muscle in the first case. Subsequently, in the third and fourth visits, score on both the parameters were reported to be negligible and by the final visit, patients reported complete relief in pain.

Moreover, in both the cases, patients expressed the ease of the application of ozone oil. No side effects were reported.

Although, it was advised to them not to massage the oil over a specific area for longer duration as it might increase the local temperature, which could manifest in the form of skin allergy. However, no such incidence of side effects was reported.

## CONCLUSION

Since time immemorial ozone is being used as a treatment modality for various medical and dental ailments. However, the use of ozone oil was limited apart from dermatological or cosmetic purposes. Therefore, an attempt was made to gauge the potential of the oil in field of temporomandibular pain disorder.

Because of its excruciating and disturbing nature, the TMJ pain disorder, often pose a dilemma before clinicians regarding the choice of appropriate and convenient treatment protocol.

Ozone oil, being a non-invasive modality and because of its relative ease of application, can prove to be a marvel modality. Nevertheless, wide range of studies is needed to be done to evaluate its true efficacy.

Therefore, on the one hand, the presented case reports display the immense capabilities of the ozone oil in relieving the temporomandibular pain disorder (musculoskeletal) and, on the other hand, it provokes an idea for future explorations.

## Ethical Clearance

Approved from the ethical committee.

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**How to cite this article:** Sunil MK, Goyal M, Lehri S, Singh V, Johar N, Garg D. Ozone Oil: The Marvel Oil for Temporomandibular Joint Disorders. *Int J Sci Stud* 2020;8(6):9-12.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.