

# Alternative Therapies in the Treatment of Temporomandibular Disorders

Ravishankar Krishna<sup>1</sup>, \*Anoop Sharma<sup>2</sup>, Shobhit Agarwal<sup>3</sup>, Sweekriti Mishra<sup>4</sup> and Sanober Khan<sup>5</sup>

\*Corresponding Author E-Mail: anoopsharma9220@gmail.com

## Contributors:

<sup>1</sup>Professor, <sup>2-5</sup>Post Graduate Students, Department of Prosthodontics, Faculty of Dental Sciences, M.S. Ramaiah University of Applied Sciences, Bengaluru - 560054

## Abstract

The main purpose of this review article is to recognize the various alternative therapies which are attempted to treat Temporomandibular Disorders (TMD) successfully. Temporomandibular joint is a complex joint which connects the mandible to the skull. This joint is one of the most dynamic in the human body and its movements are governed by the action of various muscles and ligaments. Temporomandibular disorder is a collective term used to describe a group of pathological conditions which involve the temporomandibular joint, its associated structures and its functions. There is no well-established non-surgical treatment for temporomandibular disorders due to its multifactorial and psychosomatic origin. Therefore, there is a need to know the alternative therapies and especially their effectiveness in the treatment of TMD.

**Keywords:** *Temporomandibular Disorders, TMD Therapies, Alternative Therapies*

## 1. INTRODUCTION

Temporomandibular Disorders (TMDs), also sometime mentioned as craniomandibular disorders, involves group of pathologies mainly affecting the muscle of mastication, the Temporomandibular Joint (TMJ), and related structures. Temporomandibular disorder is considered a musculoskeletal disorder of the masticatory system that affects more than 27.7% of the overall population in India<sup>1</sup>.

Diagnosing and treating TMJ disorders can be a difficult and confusing task because of its multifactorial and psychosomatic origins. The causes of many other disorders, however, are much more complex. Common medical problems such as heart disease, type 2 diabetes, and obesity do not have a single genetic cause—they are likely associated with the effects of multiple genes in combination with lifestyle and environmental factors. Conditions caused by many contributing factors are called complex or multifactorial disorders. Dentists often overlook TMDs, and try to treat the complex multifactorial psychosomatic problem with a single approach

which is mostly in the form of occlusal therapy or splints. Surely, in majority of cases occlusal splints alone will not correct this psychosomatic disorder. Therefore, alternative approaches are needed to treat such disorders. This review article aims to reveal various alternative approaches that have been tried to treat temporomandibular disorders.

## 2. MANAGEMENT

### 2.1 Thermotherapy

It is based on premise that heat increases blood circulation. Most theories believe that decrease blood flow leads to myalgia associated with muscle soreness. Thermotherapy increases the blood flow in the compromised tissue due to its action on the vessels which leads to vasodilation. It also reduces pain by way of Gate-control mechanisms. Heat provides a cutaneous peripheral input which is carried by A-beta fibers that can mask out nociceptive input carried by the C-fibers. This may explain the immediate pain relief provided with moist heat, since it would



take some time to produce a significant change in blood flow. A hot water bottle or electric heat pad can be used for heat application. Heat is applied for 10-15 minutes and it should exceed more than 30 min<sup>2</sup>.

## 2.2 Coolant Therapy

Just like heat therapy, cold therapy is also most often used for pain relief. Cold acts on muscle which are in spasmodic state and helps in relaxation and thus relieves the associated pain. Cold therapy can be applied with the help of ice bags or vapor sprays. Two of the most commonly used vapor sprays are ethyl chloride and fluoromethane. Ethyl chloride is not used nowa days because it is both cardiac depressant and flammable.

Ice should be applied in a circular motion over the painful areas. It should not be applied for more than 5-7 minutes. Vapocoolant sprays are sprayed over the affected area from a distance of 1 or 2 feet for 5 s. Care must be taken while spraying not to allow the spray to come in contact with eyes, ears, nose or mouth<sup>3</sup>.

## 2.3 Bio-Feedback

The idea behind biofeedback is that, by harnessing the power of the mind and becoming aware of what's going on inside the body, you can gain more control over your health. Biofeedback therapy involves the attachment of electrodes over the skin or a finger sensor is also available which serves the same purpose (Fig.1).

Signals are directed to a monitor through these electrodes/sensors, which will be displayed as an image, flash of light or a sound is emitted that indicated heart rate and breathing, blood pressure, temperature, or muscle activity. Any abnormal activity will be displayed on the monitor. The device is precise to detect variations that might be encountered during stress or emotional imbalance. Stress responses will be elicited on the monitor, and any intervention to control these

responses will be reflected through an immediate feedback.

This therapy uses different relaxation methods like: breathing exercises, progressive muscle relaxation techniques and guided imagery – that uses pleasant images and colors. Mindful medication method is also available which makes our mind to get indulged in peaceful thought thereby eliminating the negativity<sup>4</sup>.

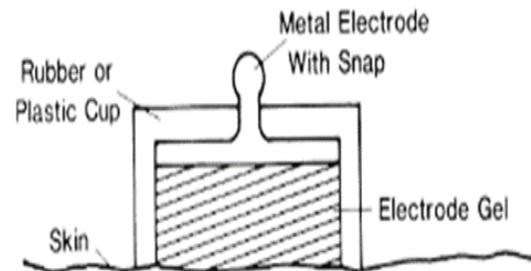


Figure 1: EMG with electrodes

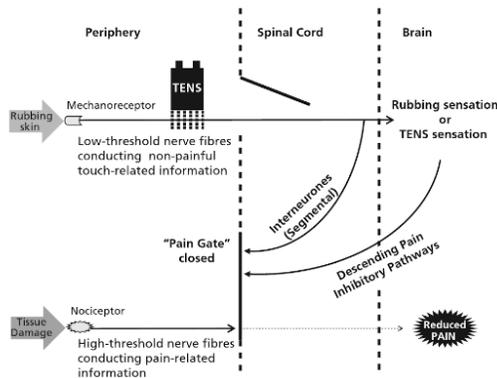
## 2.4 TENS

It causes cutaneous stimulation of cutaneous nerve fiber at a sub painful level. It uses a low voltage low amperage biphasic current of varied and is designed primarily for sensory counter stimulation in painful disorder (Fig. 2).

Treacy *et al.* concluded that than 20 sessions of TENS were not effective as compared with Muscular Awareness Relaxation Therapy (MART) or sham. Oral opening and electromyography activity for the MART group had the highest improvements when compared with other treatment (TENS and sham TENS)

Melissa Thiemi KATO did a study and found that both therapies were effective for decreasing the symptoms of TMD patients, regardless of the type of device used.





**Figure 2: Rubbing the skin or using TENS activates low threshold afferents that conduct non-painful touch –related information to the brain and also close the pain gate, preventing pain related information reaching the brain**

The cumulative effect may be responsible for this improvement, since it is just observed after several sessions, whereas the immediate effect was not significant<sup>5</sup>.

## 2.5 Ultrasound Therapy

It increases temperature at the interface of the tissue and therefore affects deeper tissues than does surface heat. It increases blood flow and also separate collagen. This improves flexibility and extensibility of connective tissues. Mehmet Ucar conducted a study which showed that the combination of home exercise combined with ultrasound appears to be more effective at providing pain relief and increasing mouth opening than does home exercise alone for patients with temporomandibular joint disorders<sup>6</sup>.

## 2.6 Stress Therapy

Increase patient awareness of muscular activity and incidence of parafunctional habits. Psychotherapy - referral may be indicated to help patient deal with stress. Relaxation therapy – exercise and yoga. Hypnosis for relaxation. Majority of the treatment comprises of medication (28.6%) which is followed by complementary and alternative medicine treatment (CAM). Relaxation therapy which

accounts for 12.7% is the most commonly employed CAM treatment which is followed by chiropractic treatment which accounts for 9.5%<sup>7</sup>.

## 2.7 Acupuncture

Acupuncture may stimulate the production of endorphins, serotonin, and acetylcholine within the central nervous system, or it may relieve pain by acting as a noxious stimulus. Acupuncture uses bodies own mechanism to reduce pain. When needles are inserted as per the location of pain, it leads to the release of endogenous opioids (endorphins, enkephalins) which floods the afferent interneurons thereby blocking the noxious stimuli. It is advisable to use electric stimulation with acupuncture (2hz of current is used)<sup>8</sup>. Johansson and colleagues conducted a study where they found that 90% of the patient who received acupuncture therapy showed significant improvement in their symptoms when compared with those who did not received any treatment<sup>8</sup>. A study conducted by Raustia and colleagues showed that results of acupuncture therapy mainly mouth opening were much higher than that with stomatognathic treatment<sup>9</sup>.

## 2.8 Physiotherapy

Physical therapy plays a very important role in strengthening the muscles. Physical therapies are often followed as a choice of treatment for temporomandibular patients because it has low cost and it is non- invasive when compared to other treatment strategies mentioned above, it allows an easy self-management approach. Physical therapies do not help in relieving the pain but has a high impact on increasing the muscle strength. There are many exercises which are advocated for patients with temporomandibular disorder<sup>10</sup>:

### i. Relaxed Jaw Position

This position is attained by placing tip of the tongue behind upper front teeth followed slowly opening your mouth till jaw muscles feel relax.

### ii. 'Goldfish' Exercise 1 (Partial Opening)

In this type of exercise, the patient is asked to place his/her tongue on the roof of mouth then index finger is placed on the TMJ on one side and other index finger is placed chin. Lower jaw is then allowed to partially drop down and back using index finger. Mouth opening is monitored in a mirror to make sure opening is straight. Patient is asked to repeat this exercise 6 times a day (Fig. 3).

### iii. Goldfish' Exercise 2 (Partial Opening)

This exercise is similar to Goldfish' Exercise 1 except in this lower jaw is allowed to drop down and back to bring the chin to the throat and partial opening is monitored in a mirror to make sure the opening is straight. This exercise is also repeated 6 times per day.



**Figure 3: Goldfish exercise with partial mouth opening**

## 2.9 Mandibular Stabilization Exercises

Lower jaw is maintained in a neutral position a then a gentle pressure is applied using index finger/thumb on. Hold the jaw in this position for 2 seconds and repeat 5 times a day (Fig.4).



**Figure 4: Mandibular stabilization exercise**

## 2.10 Mandibular Stabilization Exercises (Advanced)

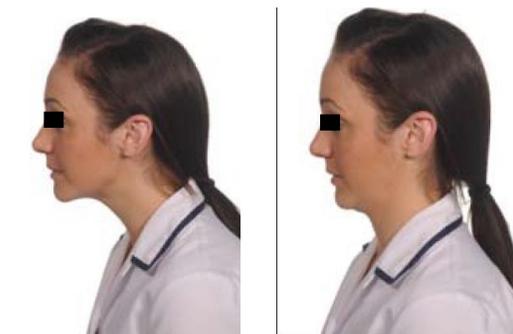
In this, knuckle of the index finger is placed between upper and lower teeth. While maintaining this position, use your index finger to apply gentle pressure.



**Figure 5: Advanced stabilization exercise**

## 2.11 Cervical Retraction 'Chin Tucks'

In a standing or sitting position patient is asked to bring his shoulders back and chest up, chin straight back, making a 'double chin'. Head should be allowed to bend up or bend as they perform this exercise. Hold for 2-3 seconds and repeat 10 times a day. Mariano Rocabado conducted a study which showed that TMJ problems may manifest itself as a postural problem or poor oral habits in the child. The teenager with an orthodontic problem, the adult with headaches and facial pain, and the older adult with incapacity caused by headaches and multiple muscular skeletal imbalances are also showing evidence of craniomandibular problems<sup>11, 12, and 13</sup> (Fig. 6).



**Figure 6: Cervical retraction chin tuck exercise**

## 2.12 Botulinum Toxin

Botulinum toxin is a biologic neuromuscular blocking agent which is used mainly in treating focal dystonias, however it also has been successfully used to provide pain relief in the head (migraine, tension headaches) and neck (cervical dystonia, whiplash-associated neck pain), suggestive of its potential role for treating patients with TMD. It is commonly understood phenomenon that Botox exerts a therapeutic effect through well described molecular actions at the neuromuscular junction. Inhabitation of acetylcholine release at synaptic junction causes a local paralytic effect, and this synaptic blockade has been taken advantage of to successfully treat a wide number of clinical problems, including movement disorders, focal hyperhidrosis, rhytids, urological pain syndromes and migraines<sup>14</sup>.

In a study conducted by S. T. Connelly showed that Fifty-five of the 71 subjects (77%) reported beneficial effects with Botox. Subjects with a concomitant bruxism diagnosis reported significant improvement over subjects without bruxism (87% vs. 67%;  $P = 0.042$ ). Subjects with stress-related psychiatric comorbidities and bruxism had a significantly higher benefit than those with stress related psychiatric comorbidities alone<sup>15</sup>.

## 3. CONCLUSION

There is insufficient evidence to draw any conclusions about the effectiveness of the various methods that have been discussed in literature to treat TMD's. The physician must therefore, be aware and well-trained about the numerous treatment options available in order to successfully treat the patient.

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