

## Orofacial pain and fibromyalgia pain: Being aware of comorbid conditions

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### Abstract

Orofacial pain originating from myofascial pain of temporomandibular disorders is the second most common source of pain, after tooth pain. However, diagnosis of myofascial pain is challenging due to its characteristic referral pattern. Furthermore, pain arising from structures in the orofacial region may be a presentation of fibromyalgia and treatment directed at temporomandibular disorders fails to alleviate the pain. Similarly, patients with fibromyalgia may present with pain in the orofacial region. The physician in this case should be aware of temporomandibular disorders, its

characteristic findings and treatment approaches that might be included in the treatment plan.

**Key words:** Orofacial pain; Fibromyalgia; Myofascial pain; Trigger point; Temporomandibular disorders

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**Core tip:** The characteristic presentation of myofascial pain and fibromyalgia pain in the orofacial region and their comorbidity is covered in this review article.

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### INTRODUCTION

Fibromyalgia (FM), characterized by widespread musculoskeletal pain, is the most common "rheumatic" disorder after osteoarthritis<sup>[1]</sup>. It is a central pain disorder resulting from abnormal pain processing with increased pain transmission and perception in the central nervous system<sup>[2,3]</sup>. Patients usually have episodic histories of pain throughout the body and have a familial history of FM<sup>[1,3]</sup>. Fibromyalgia may develop after a traffic accident or viral infection and impaired socio-economic conditions like a low family income may contribute to the onset<sup>[4,5]</sup>. The clinical diagnosis of FM is not easy as it has a myriad of symptoms. Its existence as an independent entity is not well accepted and it is usually co-morbid with other diseases<sup>[6,7]</sup>.

The characteristic symptom is generalized pain lasting more than 3 mo and described variously from burning, shooting to deep aching by verbal pain

descriptors. The pain described as hurting all over eases its differential diagnosis<sup>[6]</sup>. Irritable bowel syndrome, stiffness, fatigue, sleep disturbance, headache and mood disorders may be the accompanying symptoms<sup>[6,8]</sup>.

Fibromyalgia patients may present with orofacial manifestations, including temporomandibular disorders (TMDs), headaches and oral complaints, in which case diagnosis is a challenge for dental professionals<sup>[4,9-11]</sup>.

Temporomandibular disorders have the highest prevalence among orofacial pain conditions involving disorders of the masticatory muscles and/or the temporomandibular joint (TMJ)<sup>[12]</sup>.

The purpose of this paper is to provide a review on the presentations, diagnoses and treatment of FM and TMDs, to raise awareness on comorbid conditions for both medical and dental professionals dealing with the management of pain.

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## EPIDEMIOLOGY, ETIOLOGY, PATHOPHYSIOLOGY

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Temporomandibular joint and muscle disorders affect 5-12% of the population, with a higher prevalence rate among younger persons and in women<sup>[13]</sup>.

The overall prevalence of TMD type pain is around 4.6%, with a women: men ratio of 2:1<sup>[14,15]</sup>. Marklund *et al*<sup>[16]</sup> found that myofascial pain (MP) showed a preponderance among women in fertile ages than in men and both incidence rate and maintenance of orofacial pain for a one year follow-up period showed a gender difference.

Fibromyalgia has a female: male ratio of 2:1 with the newer diagnostic criteria which is similar to MP<sup>[17]</sup>. Canadian prevalence rates have been reported as 2%-3% for FM, with females affected up to nine times more commonly than males<sup>[18]</sup>. In a nationwide German population study, prevalence increased with age but rates did not differ significantly between males and females<sup>[19]</sup>. Comparison of the rates of diagnoses by clinical examination with random survey results revealed a remarkable number of underdiagnosed cases, especially in men, that may explain the low rate of FM among males<sup>[20]</sup>.

The rate of new onset widespread pain is common in older adults, with some predictable factors like presence of pain at baseline and presence of diffuse osteoarthritis<sup>[21]</sup>. However, FM can develop at any age, even in childhood<sup>[1]</sup>.

The real pathophysiology behind TMDs is not truly understood; trauma, either direct or indirect, micro or macro are blamed as a significant cause of TMDs. Poor posture, forward head position, sleep disorders, stress, eating disorders and psychosocial factors are counted as other possible etiological factors of TMDs, mostly believed to have a multifactorial etiology<sup>[12,22]</sup>.

The pathophysiology of FM, considered to be a centralized pain state, involves abnormal function of neuroendocrine and autonomic nervous systems,

genetic factors, environmental and psychosocial triggers like mechanical/physical/emotional trauma, and chronic stress<sup>[23]</sup>.

Psychological and psychosocial factors frequently accompany chronic pain syndromes; FM and MP have been suggested as occurring due to psychiatric distress and amplification of body sensations. Therefore, assessment may provide information about the relationship of TMDs and fibromyalgia<sup>[24]</sup>.

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## DIAGNOSTIC CRITERIA

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### **Diagnostic criteria of temporomandibular disorders**

There has been a long standing deficiency in establishing a common standard care for diagnosis and treatment of TMDs<sup>[25]</sup>. For classification of TMDs, "research diagnostic criteria for temporomandibular disorders (RDC/TMD)" originally proposed by Dworkin *et al*<sup>[26]</sup> have been used widely for both clinical and research purposes. This classification evaluates the patient in a dual axis, including both physical (Axis I) and psychosocial (Axis II) clinical assessment. Very recently, evidence-based "diagnostic criteria for temporomandibular disorders (DC/TMD)" were introduced by Schiffman *et al*<sup>[27]</sup> and Peck *et al*<sup>[28]</sup>. This classification included rarely seen but clinically apparent disorders to improve the diagnostic assessment of patients with temporomandibular disorders (Table 1).

The use of the DC/TMD protocol is appropriate for both clinical and research settings, permits multiple diagnoses and facilitates more individualized and customized care for each patient<sup>[28]</sup>. Only masticatory muscle disorders will be reviewed here since it covers both fibromyalgia and myofascial pain.

### **Diagnostic criteria for fibromyalgia**

Diagnosis of fibromyalgia is made based on the diagnostic criteria proposed by the American College of Rheumatology (ACR) in 1990 which was later modified in 2010; both have proven valid for diagnosis<sup>[29]</sup>. According to ACR criteria, FM diagnosis can be made if the 3 conditions in the box (Table 2) below are met<sup>[30]</sup>.

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## CLINICAL PRESENTATIONS AND DIAGNOSIS

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### **Clinical presentation and diagnosis of MP**

Pain originating from masticatory muscles is considered to be musculoskeletal pains of the deep somatic category. A patient with myofascial pain presents with a history of pain in the orofacial region, mostly in the temple and cheek and aggravated with chewing and talking. Pain is not well localized, usually diffuse, with a dull, depressing quality<sup>[12,26,27]</sup>. Pain is described as aching, tight, throbbing and tender<sup>[31]</sup>.

Myofascial pain is a condition in which pain originates from either the masseter muscle or temporalis muscle that may be duplicated by palpation for 5 s. Pain on palpation may be limited to the site of finger pressure,

**Table 1** Diagnostic criteria for temporomandibular disorders<sup>[27,28]</sup>

Temporomandibular joint disorders
Joint pain
Joint disorders
Joint diseases
Fractures
Congenital/developmental disorders
Masticatory muscle disorders
Muscle pain
Myalgia
Local myalgia
Myofascial pain
Myofascial pain with referral
Tendonitis
Myositis
Spasm
Contracture
Hypertrophy
Neoplasm
Movement disorders
Masticatory muscle pain attributed to systemic/central pain disorders
Fibromyalgia/widespread pain
Headache
Headache attributed to TMD
Associated structures
Coronoid hyperplasia

TMD: Temporomandibular disorders.

may exceed the site of palpation but stay within the boundaries of the muscle or may even spread beyond the boundaries of the muscle. Pain is mostly referred to anatomical parts in close proximity; mostly to teeth, ears and eyes when the boundaries of the palpated muscle are exceeded. The onset and severity of pain is highly attributed to jaw functions or parafunction. Limited mouth opening may accompany pain<sup>[27,28]</sup>.

If the patient has signs and symptoms of myofascial pain and also has a diagnosis of fibromyalgia, myofascial pain is considered to be related to fibromyalgia<sup>[27]</sup>. These cases are characterized by the presence of widespread pain apart from the masticatory muscle pain. Localization of pain in the orofacial area is similar to those in myofascial pain. However, diverse pain complaints may be present, from back pain to headache<sup>[27,28]</sup>.

In the DC/TMD classification, diagnoses are made according to the signs and symptoms in the last 30 d rather than the etiologies and added further diagnoses for muscle pain disorders. However, the presence and number of trigger points is not mentioned in this classification.

In patients presenting with pain in the orofacial region, the differential diagnosis should be made based on detailed anamnesis, including the patient's history of signs, followed by clinical examination. Imaging should be considered if needed<sup>[32]</sup>.

### **Clinical presentation and diagnosis of FM**

The American College of Rheumatology<sup>[30]</sup> recognizes fibromyalgia as a true syndrome of diffuse body pain.

**Table 2** American College of Rheumatology criteria for diagnosis of fibromyalgia<sup>[30]</sup>

WPI > 7 and a symptom SS > 5 or WPI 3-6 and SS > 9
Symptoms have been present at a similar level for at least 3 mo
The patient does not have a disorder that would otherwise explain the pain

WPI: Widespread Pain Index; SS: Severity scale.

Pain is the primary complaint, with its presence for at least 3 mo required for verifying diagnosis. It is intermittent at the beginning and becomes more persistent as it progresses<sup>[33]</sup>. Pain is described as aching, throbbing and/or stabbing<sup>[4]</sup>. Sleep disturbance, fatigue, irritable bowel syndrome, headache and mood disturbance accompany this syndrome. The diagnosis is made by history, clinical evaluation and physical examination.

In the 2010 diagnostic criteria, FM is considered as a systemic somatic condition, a symptom complex, and its diagnosis does not rely on counting the tender points. A two part self-administered questionnaire, Part 1 assessing pain at 19 sites by the Widespread Pain Index (WPI) and Part 2 measuring intensity of symptoms like fatigue, headache and abdominal pain by the symptom severity (SS) scale, is used as the tools of the 2010 fibromyalgia diagnostic criteria<sup>[3]</sup>.

No confirmatory diagnostic test is required<sup>[33]</sup>.

### **Trigger points**

Trigger points (TP), the taut bands, actually a contracted group of muscle fibers of skeletal muscles, tendons or ligaments, have long been believed to be present in myofascial pain syndrome. Pain occurs when the TP is palpated and can be irradiated to distant areas within myofascial structures. A reproducible duplication of a patient's pain complaint with palpation of the tender area is recognized as diagnostic<sup>[3]</sup>.

Differences in the prevalence and the anatomical localization of trigger points were compared in a study. Active trigger points were found to be  $6 \pm 1$  for MP and  $4 \pm 1$  for FM. A significant association with TPs and pain was found only in MP. Women with MP exhibited a greater number of active TPs in temporalis and masseter muscles than women with FM. On the other hand, larger referred pain from sternocleidomastoid and suboccipital muscles were found in women with FM than in those with MP. However, in the new classification, the term tender points replaces trigger points. It is emphasized that tender points in FM do not have taut bands and they do not refer pain to distant sites<sup>[34]</sup>.

In a Cochrane review dated 2012, myofascial pain syndrome is described as a regional muscular pain syndrome with painful trigger points in one or more muscles. The pain may either be localized to the site of trigger points or may extend away from the site of palpation<sup>[35]</sup>.

### Relationship of MP with FM

Fibromyalgia and myofascial pain are two main musculoskeletal pain conditions that patients seek treatment for because of pain and fatigue<sup>[2]</sup>. There are various opinions on the relationship of MP with FM or vice versa. While some authors believe that these disorders belong to the same spectrum of chronic widespread pain conditions, others accept that these two disorders belong to distinct types with similar underlying pathophysiology<sup>[17,19]</sup>.

Both conditions are associated with central sensitization. Fibromyalgia is a central pain disorder occurring because of abnormal pain processing within the central nervous system. Myofascial pain, which initially starts as a peripheral disorder with pain localized within muscle, progresses to central sensitization that causes referred pain. FM and MP which have similar pathophysiological processes may occur concomitantly<sup>[2,3]</sup>.

It has been found that 75% of patients with FM have signs and symptoms of MP, while 18% of patients with MP meet the FM criteria<sup>[24]</sup>. Likewise, 59% of patients with TMD reported 2 or more comorbid pains in a large United States Health interview survey, whereas only 0.77% reported it without any comorbid conditions<sup>[11]</sup>.

Manfredini *et al*<sup>[36]</sup> found that while 86.7% of patients with fibromyalgia have concomitantly reported signs and symptoms localized at the orofacial region, fibromyalgia affected only 10% of patients with temporomandibular disorders. In another study, 85% of FM patients reported facial pain, with 77.5% later receiving a diagnosis of myofascial TMD<sup>[37]</sup>.

The percentage of patients meeting the clinical RDC/TMD criteria among FM patients reporting face pain has been found to be 71%<sup>[4]</sup>, consistent with the finding of Plesh *et al*<sup>[11]</sup>. Furthermore, almost half of FM patients have not reported facial pain, thinking that it is related to FM, and also met the diagnostic criteria for temporomandibular disorders<sup>[4]</sup>.

Both MP and FM may present with irritable bowel syndrome, with a ratio of 32%-80% for FM patients and 64% for TMD patients<sup>[24]</sup>. Besides, different types of headaches like migraine or tension type headaches, irritable bowel syndrome, hypermobility syndromes, painful bladder syndrome, pelvic pain syndrome, vulvovaginitis, endometriosis, dysmenorrhea, prostatitis and hypothyroidism have been reported to be commonly associated with both FM and MP. Vitamin D and B12 deficiency, iron deficiency, parasitic infection and celiac disease of malabsorption have been reported to be more commonly associated with MP<sup>[3]</sup>.

### Treatment

Since no exact causative factors responsible for MP and FM have been isolated so far, treatment of those conditions is directed towards restoring function of the descending nociceptive inhibitory system, restoring sleep patterns, alleviating pain and treating comorbid

medical conditions<sup>[2,3]</sup>.

A thorough patient history including the chief complaint of the patient, clinical exam and imaging if needed leads to a proper diagnosis of TMDs. Conservative, reversible and evidence-based therapeutic modalities should be attempted as the first step treatment of TMDs<sup>[32]</sup>.

The aim for the treatment of FM patients is to restore function. Like TMDs, patients with FM respond to simple and conservative interventions like stress reduction, cognitive behavioral therapy, restoring sleep pattern, treating comorbid medical conditions and exercise<sup>[3]</sup>.

Medical therapies and more advanced interventions are needed for an individual patient-based approach if initial interventions fail.

## CONCLUSION

Patients with pain in the orofacial region mostly seek treatment from dentists, while patients with generalized pain go to medical doctors. Both professionals should be aware of the comorbidity between FM and MP when they examine patients. The importance of making a distinction between these 2 disorders is necessary, mostly for proper treatment and avoiding overtreatment.

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