



# Fibromyalgia: practical considerations for oral health care providers

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Fibromyalgia is a syndrome characterized by chronic pain in the skeletal system accompanied by stiffness, sleep disturbance, fatigue, and psychiatric problems, such as anxiety and depression. Fibromyalgia commonly affects orofacial health, presenting with a variety of oral manifestations, including temporomandibular disorder, xerostomia, glossodynia, and dysgeusia. Therefore, oral healthcare providers need to be aware of this clinical entity to effectively manage oral symptoms and provide proper oral self-care modification and education on the nature of fibromyalgia. This review focuses on the epidemiology, pathophysiology, clinical manifestation, diagnosis, orofacial concerns, and treatment of fibromyalgia.

**Keywords:** Dysgeusia; Fibromyalgia; Glossodynia; Oral Health; Temporomandibular Joint Disorder; Xerostomia.

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Fibromyalgia (FM) is a chronic pain syndrome characterized by widespread musculoskeletal pain and specific sites of tenderness, stiffness, and fatigue. In particular, specific tender regions are detected without signs of inflammation in patients with FM. This can severely decrease the quality of life and affect any region in a patient, including the orofacial area [1,2]. Oral care practitioners can detect the early symptoms of FM and assist patients in receiving the proper diagnosis and treatment. The epidemiology, pathophysiology, clinical manifestation, diagnosis, orofacial concerns, and treatment of FM are reviewed here.

## EPIDEMIOLOGY

FM has been diagnosed in 3–6% of the population, imposing substantial medical costs [3]. It occurs in up

to 4% of men and 2.5–10.5% of women with a peak onset of disease in middle age (45–60 years). FM has a familial preponderance with variable manifestations [4,5]. It is prevalent in lower socioeconomic groups, which have members more likely to work in manual occupations, leading to an increase in trauma and pain [6,7].

## PATHOPHYSIOLOGY

The etiology of FM is unknown. It is associated with a multifactorial etiology. First-degree relatives with FM are 8.5 times more likely to have this disorder than the general population [5]. However, genetic factors associated with FM are unknown. It has been suggested that serotonin- and dopamine-related genes may play a role in the pathogenesis of FM [8].

Many researchers report that patients with FM have

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neuroendocrine dysfunctions such as hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis and sympathoadrenal system, and relative hypocortisolism [9,10]. Emotional and physical stress can affect the HPA axis [9,10].

Patients with FM have a three times higher concentration of substance P in the cerebrospinal fluid than healthy controls [11]. Activation of the N-methyl-D-aspartate receptor (NMDAR) is increased in FM patients. Substance P modulates the responsiveness of the NMDAR to glutamate, which consequently leads to temporary central sensitization and temporal summation in otherwise healthy individuals [12,13]. It has been demonstrated that serotonin levels in the serum are reduced and inversely correlated with pain threshold in FM patients [14,15]. Combined dysfunctional neurotransmitter systems, such as low serotonin and high substance P levels, can produce more pain than either abnormality on their own and be responsible for the onset of FM [16,17].

Dysfunction of the autonomic nervous system is common in FM patients. Positional changes often result in syncope, palpitations, and dizziness [18,19]. Heart rate variability among FM patients is reduced due to an increased nocturnal exaggerated sympathetic modulation of the sinus node [18,19]. Abnormal functioning of the HPA axis leads to dysregulation of diurnal cortisol production, which can result in cortisol deficiency and maladaptation [14]. This abnormal chronobiology is linked to sleep disturbances and fatigue in FM patients [14,19].

Research has demonstrated that FM patients have a lower level of dopamine, which plays a central role in modulating pain perception and natural analgesia within supraspinal regions and the spine in painful conditions [20,21]. It was found that several serum pro-inflammatory cytokines, such as tumor necrosis factor (TNF)- $\alpha$  and interleukin, are involved in the generation of symptoms in FM, including sleep disturbances, fatigue, and myalgia [8,22-24]. It has been suggested that oxidative stress may also play a role in the pathophysiology of FM. Several

studies have shown that lipid peroxidation is correlated with pain, depression, and quality of life in FM patients [24,25]. The severity of pain was significantly associated with oxidized low-density lipoprotein [24].

Physical trauma, infection, and psychosocial factors are reported to be associated with the onset of FM [26,27]. Environmental triggers, such as acute illness and psychosocial stress, may alter the pain modulatory response in the brain, leading to enhanced pain perception [27].

## CLINICAL MANIFESTATIONS AND DIAGNOSIS

FM is a complex systemic disorder characterized by generalized musculoskeletal pain and specific sites of tenderness, sleep disturbance, stiffness and fatigue, and psychological problems [1,2]. The diagnosis of fibromyalgia is based predominantly on the patient's history and physical examination findings. However, it is difficult because patients with FM may have several comorbid conditions, such as a history of headaches, temporomandibular disorder (TMD), irritable bowel syndrome, interstitial cystitis, myofascial pain syndrome, and restless leg syndrome [1,28]. FM is defined as a chronic musculoskeletal pain syndrome of unknown etiology, characterized by widespread pain for more than 3 months and tenderness in at least 11 out of 18 tender point sites by the American College of Rheumatology (Table 1) [29].

Psychiatric conditions, such as depression, panic disorder, anxiety, and post-traumatic stress disorder, are common in FM patients [30]. FM patients are more than three times as likely to have psychiatric disorders than the general population. It was found that the psychiatric disorders associated with FM greatly compromise the quality of life of affected patients [31,32]. Sleep disturbances such as non-restorative sleep, insomnia, and poor quality sleep, are reported to be higher in patients with FM, which is strongly associated with pain and fatigue [1,33].

Table 1. Excluded studies with reasons

Criteria
A patient meets the diagnostic criteria for Fibromyalgia if these three conditions are met: Widespread pain index $\geq 7$ and symptom severity scale score $\geq 5$ , or widespread pain index 3 to 6 and symptom severity scale score $\geq 9$ The patient has been experiencing symptoms at a similar level for 3 months or longer The patient does not have any other condition that would explain the pain
Scoring
Widespread pain index: Count the number of regions the patient reports pain within the last week Score will range from 0 to 19. Symptom severity scale score*: Indicate how severe each of these three symptoms (fatigue, waking unre-freshed, cognitive symptoms) have been over the past week using the following scale: 0 - No problem 1 - Slight or mild problems 2 - Moderate, often present and/or at a moderate level 3 - Severe, continuous, life-disturbing problems Considering common other symptoms, note whether the patient has: 0 - No symptoms 1 - Few symptoms 2 - A moderate amount of symptoms 3 - Many symptoms

\*The symptom severity scale score is the sum of the severity of the three symptoms (fatigue, waking unrefreshed, cognitive symptoms) and the extent of the other symptoms in general. The score ranges between 0 and 12.

## OROFACIAL CONCERNS ASSOCIATED WITH FM

Many patients with FM have orofacial pain disorders, such as TMD and oral complaints [22,34].

TMD is a term encompassing chronic orofacial pain conditions involving the masticatory muscles, temporomandibular joint, and associated structures. The exact etiology and progression of TMD are poorly understood, while the primary pathology appears to be a degenerative condition, such as osteoarthritis or osteoarthrosis [22,35]. The prevalence of TMD ranges from 42% to 94% in FM patients [35,36]. Therefore, it was suggested that FM may be a predisposing factor for the onset of TMD [37,38]. It has been reported that the masticatory muscles are sensitive and can be tender points in patients with FM [37]. The comorbidity of TMD and FM may lead to or be a consequence of the centrally mediated alteration in pain perception [39-41]. Therefore, routine treatments for patients with TMD and FM may not be effective [39]. Occlusal splints were found to be ineffective in relieving myofascial pain in patients with widespread pain [42]. It was reported that full body tactile stimulation using

massage was effective to improve the signs and symptoms of TMD in patients who are refractory to conservative TMD treatment [43]. Failure to diagnose underlying FM may not provide appropriate treatment. FM patients with TMD are associated with several comorbidities and psychosocial problems.

FM patients may present with numerous oral complaints, such as xerostomia, glossodynia, and dysgeusia.

Xerostomia, known as dry mouth, is a subjective sensation of dryness in the mouth, which often accompanies salivary gland hypofunction. The incidence of xerostomia with FM varies from 7% to 71% [39,44]. FM patients with various comorbidities are usually managed with xerostomia-inducing medications including antidepressants, sedatives, and muscle relaxants [44,45]. It was demonstrated that about 71% of FM patients have xerostomia, while only 27.5% of FM patients receive xerogenic medications [44]. This suggests a significant prevalence of xerostomia in FM patients independent of the use of xerogenic medications [44]. Xerostomia can increase the rates of caries, periodontal disease, dysphasia, mouth ulcers, and candidiasis. Therefore, it is important to provide appropriate treatment for xerostomia

and avoid oral complications [45].

Glossodynia (burning mouth syndrome) is also commonly noted in FM patients. Approximately 33% of patients with FM experience glossodynia [44]. Hormonal disturbance, malnutrition, and depression are also associated with burning mouth syndrome [44,46]. The exact etiology and pathogenesis of burning mouth syndrome remains unclear. Neurological mechanisms, including peripheral neurogenic damage and central hyperexcitability, may induce hyperalgesia and allodynia in FM patients with glossodynia [39,44]. Antidepressants, such as amitriptyline, are reported to be effective in treating FM with glossodynia [39,47]. In addition, the use of saliva substitutes and sialagogues and avoiding consumption of alcohol and caffeine are recommended for FM patients with xerostomia [39,47].

Dysgeusia is a taste disorder that causes foul, rancid, metallic, or salty taste perception. Dysgeusia was reported in 34.2% of FM patients [44]. This can represent a symptom of somatization or side effect of xerogenic medications [44,46].

Headache is reported by 35% to 82% of FM patients [48,49]. Migraine or tension-type headache is common in FM patients. It was demonstrated that chronic headache was endorsed by 76% of treatment-seeking FM patients, with 84% reporting substantial or severe impact from their headaches [40,48]. Therefore, it was suggested that assessment of headache should be a part of the routine evaluation of patients with FM [49].

## PATIENT MANAGEMENT

The clinical presentation of FM varies. Patients should be questioned about a detailed history of orofacial complaints, current medications, and commodities. When the diagnosis of FM is suspected, the patients can be referred to a pain physician or rheumatologist for appropriate diagnostic workup and treatment [46].

A multidisciplinary approach is required for the treatment of patients with FM. Education, pharmaco-

**Table 2.** Treatments for fibromyalgia

<b>Education</b>
Nature of fibromyalgia
The difference between the chronic, widespread pain and pain from an oral disease or infection
<b>Pharmacologic therapy</b>
Tricyclic antidepressants: amitriptyline, nortriptyline
Selective serotonin reuptake inhibitors: fluoxetine, sertraline, paroxetine
Serotonin-norepinephrine reuptake inhibitors: venlafaxine, duloxetine
Muscle relaxants: cyclobenzaprine, tizanidine
Anticonvulsants: pregabalin
Sedative hypnotics: zolpidem
Analgesics: tramadol, opioid, nonsteroidal anti-inflammatory drugs
<b>Nonpharmacologic therapy</b>
Cognitive behavioral therapy
Relaxation therapy
Low impact and aerobic exercises
Soft tissue massage
Medicinal bath
Trigger point and tender point injections
Combined therapy of ultrasound and inferential current

logical therapy, and nonpharmacological therapy are the mainstay of treating pain and associated conditions in patients with FM (Table 2). [1,2]. Strategies to reduce stress during oral care, build a trusting relationship between the patient and the practitioner, and provide effective pain management are required [39]. One of the most important aspects in the treatment of FM is to recognize the nature of this disease. FM is not an acute but chronic condition [39,46,50]. Therefore, the aim of treatment is to manage symptoms of FM, such as pain, sleep disturbance, and depression. A variety of medications are used to treat the symptoms of FM (Table 2). Polypharmacy is usually employed. Pharmacological treatment should be guided toward pain as well as comorbidities. Healthcare providers should be familiar with the side effects of drugs and possible adverse drug reactions associated with multiple medications. For instance, combined treatment with antidepressants and anticonvulsants can increase dry mouth, sedation, dizziness, and constipation, compared with that with each treatment alone [50].

Pharmacological treatment alone is often ineffective in treating FM [39]. The combination of education, cognitive behavioral therapy, and exercise regimens with

pharmacologic treatment are important for managing FM [50]. These therapies are reported to provide long-term beneficial effects with an improvement in symptoms and overall quality of life [46,49,50]. Psychological interventions, including basic body awareness therapy, cognitive-behavioral therapy, and imagery intervention, are often used for FM [39,50]. Other nonpharmacologic therapies such as heat application and dietary modulation are also effective [50].

Due to pain and comorbidities, it is often difficult for patients with FM to perform effective oral health self-care, which can lead to perioral lesions such as ulceration and aphthous stomatitis [36]. Perioral infection exacerbates stress on the body, which consequently worsens the symptoms of FM. Oral health care providers should frequently monitor oral self-care and help prevent oral diseases and infections [39,46].

FM patients commonly have various psychiatric disorders. It is important to reduce emotional stress and anxiety prior to their oral hygiene treatment. In addition, FM patients often complain of heightened pain sensitivity and fatigue [27]. Poor management of pain and stress can lead to adverse patient outcomes. Therefore, pretreatment with anti-anxiety drugs and topical and local anesthetic agents is beneficial for the management of discomfort during oral healthcare [39,50].

## CONCLUSION

FM affects the overall health of patients, and FM patients commonly present with a variety of oral manifestations, including temporomandibular disorder, xerostomia, glossodynia, and dysgeusia. Therefore, oral healthcare providers need to be aware of this disorder to better manage oral symptoms and provide proper oral self-care modification and education about the nature of FM. Additionally, it should be considered to provide a stress-free treatment environment.

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