

# Musculoskeletal Disorders

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## KEYWORDS

- Temporomandibular disorders • Multifactorial causalities • Myofascial pain
- Neuroplasticity • Degenerative joint disorders • Conservative treatments

## KEY POINTS

- After rolling out dental pathologies, the most prevalent cause of a patient's chief orofacial complaint is musculoskeletal pain, usually referred to as temporomandibular disorder (TMD).
- The typical signs and symptoms of TMD are pain, limited range of motion, and temporomandibular joint sounds. Provocation and function, such as palpation and mastication, may aggravate the pain.
- TMD is a complex musculoskeletal disorder with a multifactorial etiology. The physical, behavioral, and emotional factors may overlap and interact resulting in the TMD signs and symptoms.
- Long-term peripheral inputs can produce changes in central structures related to pain processing. These adaptive changes are part of the central sensitization process that promotes amplification of the incoming signal, explaining the features of the centrally mediated pain.
- Management aims to reduce pain and to improve function with a combination of noninvasive therapies.

## INTRODUCTION

Temporomandibular disorder (TMD), a type of musculoskeletal pain, is one of the main causes of painful conditions in the orofacial region. It is a condition that embraces some clinical problems involving the masticatory muscles, temporomandibular joints (TMJs), and associated structures. The most common signs and symptoms are pain, limited range of motion, and TMJ sounds.<sup>1</sup>

TMD is a highly prevalent condition. In a previous study, 39.2% of the sample reported at least one TMD symptom, and 25.6% of them reported some pain related

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to TMD.<sup>2</sup> The prevalence rate ranges between 4.0% and 25.5% in adolescents.<sup>3–5</sup> Among adults, an annual incidence rate of TMD diagnosis has been reported at 3.9%, and a rate of 4.6% for TMD pain is self-reported in adolescents.<sup>6,7</sup> It affects women more frequently than men with a sex ratio of approximately 2:1 (women:men) observed in population-based studies, and at least 4:1 in clinical settings.<sup>8</sup> There are no gender differences among children, but as the age increases, the sex ratio become approximately 2:1 (girls:boys) among young adults.<sup>9</sup>

It is relevant emphasizing that a single factor does not cause TMD. It results from the interaction of the risk factors. Therefore, the TMD etiology is multifactorial, with many predisposing, precipitating, or maintaining risk factors.<sup>1</sup> An extensive prospective study is being conducted to investigate the possible risk factors, assessing the genetic and phenotypic measures of biological, psychosocial, clinical, and health status characteristics.<sup>10</sup> Some of the investigated risk factors have been confirmed, but the study is also pointing for new findings, including biological factors, the role of endogenous opioid function, differences in genotypes, trauma, parafunction, and psychosocial factors.<sup>11</sup>

## **PATHOPHYSIOLOGY AND CLASSIFICATION OF ARTICULAR TEMPOROMANDIBULAR DISORDER**

Articular TMD embraces several alterations affecting the hard and the soft tissues of the TMJ. The most recent and valid criteria classify the articular TMD in (1) joint pain, (2) joint disorders, (3) joint diseases, (4) fractures, and (5) congenital/developmental disorders (**Box 1**). Herein, we present the most common conditions.<sup>1</sup> A detailed description of the less common articular TMD is beyond the scope of this article, and readers are referred to reference publications.<sup>1,12</sup>

In general, the main signs and symptoms of articular TMD are pain in the joint area, limited and/or altered mandibular movement, and TMJ sounds such as clicking, popping, or crepitus.

### ***Joint Pain***

Arthralgia and arthritis are the 2 subtypes of joint pain. Arthralgia is affected by jaw movement, function, or parafunction, whereas arthritis, also called synovitis or capsulitis, is related to intra-articular inflammation or infection accompanied by edema, erythema, and/or increased temperature. In both cases, limitation of mandibular movement may occur due to the pain.<sup>1,13</sup> Evidence from human studies points to changes in the joint chemistry of patients with articular TMD, including, but not limited to, glutamate, cytokines, and serotonin (5-hydroxytryptamine [5-HT]). Overall, further investigations are needed to clarify the specific role of each of these mediators for diagnosis, treatment, and prognosis of joint conditions.<sup>14</sup>

#### **Box 1**

##### **Temporomandibular joint disorder classification**

1. Joint pain: arthralgia; arthritis
2. Joint disorders: disk disorders; other hypomobility disorders; hypermobility disorders
3. Joint diseases: degenerative joint disease; systemic arthritides; condylosis/idiopathic condylar resorption; osteochondritis dissecans; osteonecrosis; neoplasm; synovial chondromatosis
4. Fractures
5. Congenital/Developmental Disorders: aplasia; hypoplasia; hyperplasia

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