



Possible etiological factors and clinical features of TMD

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Abstract

The temporomandibular joint (TMJ) is decisive for normal jaw function such as chewing, swallowing, speaking, oral health, and nutrition. Temporomandibular disorders (TMDs) refer to a group of disorders affecting the TMJ, masticatory muscles, and the associated structures. TMDs are considered as a multifactorial disorder. These conditions have been unable to reveal a common etiology or biological basis in terms of apparent signs and symptoms, and hence considered a heterogeneous group of health problems associated with chronic pain. These disorders share the symptoms of pain, limited mouth opening, and joint noises. The causes of TMDs range from traumatic injury to immune-mediated systemic disease to neoplastic growth to incompletely understood neurobiological mechanisms. This article presents an overview of the various etiological factors, signs, and symptoms related to TMDs.

Introduction

Temporomandibular joint (TMJ) is a unique joint in which translatory as well as rotational movements are possible and where both ends of bone articulate in the same plane with that of other bone. It is also called as ginglymoarthrodial type of joint wherein it has sliding movement between bony surfaces in addition to hinge movement similar to diarthrodial joint.^[1] Temporomandibular disorders (TMDs) are defined by the American Academy of Orofacial Pain as “a collective term that embraces a number of clinical problems that involve the masticatory muscles, the TMJ and the associated structures.” Its key characteristics are pain in the TMJ and surrounding tissues; dysfunction, clicking and locking of the mandible. The signs and symptoms of TMD are experienced by up to 60% of the general population at some stage in their life occurring across all ages and gender.^[2] Commonly patients present first to their dentist for initial management.

Etiology

TMDs have multiple etiological factors. Many studies show a poor correlation between any single etiological factor and resulting signs and symptoms.^[3] In fact, the TMJ and masticatory system are complex, and thus, requires a thorough understanding of the anatomy and physiology of the structural, vascular and neurological components to manage TMD. Alterations in any one or a combination of teeth periodontal ligament, the TMJ,

or the muscles of mastication eventually can lead to TMD. Etiologic factors contributing to the development of TMD are as the following section.

Trauma

The injuries to the joint can be direct or indirect. The microtrauma as in bruxism and macrotrauma such as direct blow to the face may provoke tearing in ligaments that affect the temporalis and masseter muscle by the impulsive movement of the mandible.^[4] Other factors include impact injuries such as trauma to the chin which is considered to be a factor in the development of TMD in pediatric patients.^[5] Unilateral and bilateral intracapsular or subcondylar fractures are the most common mandibular fractures in children. Closed reduction and prolonged immobilization can result in ankylosis.^[6,7]

Parafunctional habits such as bruxism, clenching, hyperextension, and other repetitive habitual behavior may lead to TMD by joint overloading that leads to cartilage breakdown, synovial fluid alterations and other changes within the joint.^[8] Children who grind their teeth were found to complain more often of pain and muscle tenderness during functional movement of the jaw.^[9]

Occlusal factors

The occlusal factor does not play an important role in the development of TMD.^[10,11]

Posture

Craniocervical posture has been associated with occlusion and with dysfunction of the TMJ, including abnormalities of the mandibular fossa, condyle, ramus, and disc.^[12-14] Changes in “free-way” dimension of the rest position that is normally two to four mm may be impinged by occlusal changes, disease, muscle spasms, nervous tension, and restorative prosthetics.^[3]

Orthodontic treatment

Current literature does not support that the development of TMD is caused by orthodontic treatment, regardless of whether premolars were extracted prior to treatment.^[15]

Gender

The TMJ dysfunction is a more prevalent in females of reproductive age, as compared to males affecting up to 80% and pain associated with dysfunction occurs in about 75% of the patients.^[16]

Psychological factors

The psychological factors such as emotional behavior, stress, and personality disorders may be predisposing factors in the development of TMJ dysfunction as they can result in excessive load on the masticatory system. The pain dysfunction may be directly or indirectly related with an emotional status of the person.^[17]

Clinical Features

The clinical features of temporomandibular disorders may differ in their presentation that may affect the various components of the masticatory system. The signs and symptoms of TMD are as the following section.

Pain

Pain is the main characteristics of most TMDs and also the main reason for patients to seek treatment. Pain may be present at rest, may be continuous or intermittent and characteristically increases with jaw functions. The pain may be dull, poorly localized and unilateral rather than bilateral. It is rarely severe.^[18] The pain may occur as a result of the contraction of the masticatory muscles which stimulates extravascular production of inflammatory cytokines around TMJ.^[19]

Limited range of mandibular movement may be the presenting sign of TMDs. There may be locking of the joint, tenderness in the jaw muscles, joints and deviation or deflection of the mandible during the movement of the jaw. The secondary inflammation of the synovial membrane may lead to a degenerative joint disease produces a cascade of events leading to the failure of lubrication system and destruction of the articular surfaces leading to the fibrosis and the weakness of the muscle.^[20]

Joint sounds

A clicking or popping noise during opening or closing the mouth or while chewing may be the commonest sign of TMD occurring in about 13.5% of patients indicate the articular disc disorders of TMJ.^[21]

A headache occurs in approximately 22% of TMD patients which may arise from neural, vascular, muscular, ligament, and bony tissues as it forms a functional complex with the cervical region.^[22]

Aural symptoms

The relationship between aural symptom and TMD was first described by Costen in 1934 and was named as Costen’s syndrome. Aural symptoms such as tinnitus, otalgia, dizziness, and vertigo are related with TMD patients, it may occur in 85% of patients the occurrence of the aural symptoms may be attributed to the fact that both TMJ and middle ear arise from the meckel cartilage in embryonic life. Moreover, the masticatory muscle and the ear have common innervation.^[23,24]

Conclusion

TMDs are only one of hosts of unusual conditions that are part of chronic orofacial pain disorders. TMD is a multifaceted condition of yet unknown pathogenesis. It is important to investigate the etiological patterns of this disorder and the various clinical and laboratory investigations related to the etiology of TMD, provide an insight for the management of patients with TMD. The diagnosis and management of TMD may be one of the most challenging yet rewarding aspects of dental practice. Therefore, it is crucial to adopt a multidisciplinary approach while evaluating and for the management of TMDs patients.

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