

Temporomandibular Disorders and Headache



Steven B. Graff-Radford, DDS^{a,b,c,*}, Jeremy J. Abbott, DDS^d

KEYWORDS

• Temporomandibular joint • Temporomandibular disorder • Treatment • Headache • Migraine

KEY POINTS

- In patients presenting with comorbid TMD and headache, each disorder should be separately identified and diagnosed using standardized diagnostic criteria.
- Once the disorders are identified, the predisposing, causative and perpetuating factors of each condition should be addressed and minimized.
- When necessary in headache patients, TMD treatment should involve patient education, self-care therapy, behavioral interventions, pharmacologic interventions, and physical therapies including occlusal splints.
- When considering appropriate headache treatment, physical, behavioral, and pharmacologic options should be evaluated for the potential benefit of both disorders without reducing headache treatment principles.

INTRODUCTION

Temporomandibular disorders (TMD) and primary headaches can be perpetual and debilitating musculoskeletal and neurological disorders. The presence of both can affect up to one-sixth of the population at any one time.^{1–3} Initially, TMDs were thought to be predominantly musculoskeletal disorders, and migraine was thought to be solely a cerebrovascular disorder. The further understanding of their pathophysiology has helped to clarify their clinical presentation. This article focuses on the role of the trigeminal system in associating TMD and migraine. By discussing recent descriptions of prevalence, diagnosis, and treatment of headache and TMD, we will further elucidate this relationship. Historically, migraines were attributed to cerebrovascular change owing to arterial vasoconstriction producing aura, followed by vasodilation causing pain, mediated via the trigeminal

ophthalmic division afferent projections.^{4,5} This theory has changed to a neurally mediated pain and aura and a secondary vascular role.⁶ Migraine occurring outside of the ophthalmic division were reported in 1977 by Raskin,⁷ who described recurring vascular neck pain with carotid tenderness that was reduced with prophylactic migraine medication. Subsequently, migraine has been associated with pain in the sinus, temporomandibular joint (TMJ),⁸ teeth,⁹ and cervical areas.¹⁰ This association was clarified by Bartsch and Goadsby¹¹ when describing how central sensitization creates a neural pathway between trigeminal and central afferents. TMD has been described as a group of musculoskeletal and neuromuscular conditions that involve the TMJs, the masticatory muscles, and all associated tissues.¹² TMDs are functional disorders of the anatomic regions of the TMJ and associated musculature including arthritides and myogenous pains.¹³ TMDs are thought to create

^a The Pain Center, Cedars-Sinai Medical Center, 444 South San Vicente Boulevard #1101, Los Angeles, CA 90048, USA; ^b The Program for Headache and Orofacial Pain, Cedars-Sinai Medical Center, Los Angeles, CA, USA; ^c UCLA School of Dentistry, Los Angeles, CA, USA; ^d West Coast Ear, Nose & Throat Medical Group, 301 South Moorpark Road, Thousand Oaks, CA 91361, USA

* Corresponding author. The Pain Center, Cedars-Sinai Medical Center, 444 South San Vicente Boulevard #1101, Los Angeles, CA 90048.

E-mail address: grafts@cshs.org

Box 1**International Classification of Headache Disorders-3 (beta) criteria for headache attributed to TMD (11.7)***Description:*

Headache caused by a disorder involving structures in the temporomandibular region

Diagnostic criteria:

- A. Any headache fulfilling criterion C
- B. Clinical and/or imaging evidence of a pathologic process affecting the TMJ, muscles of mastication, and/or associated structures
- C. Evidence of causation shown by at least 2 of the following:
 1. Headache has developed in temporal relation to the onset of the TMD
 2. Either or both of the following:
 - a. Headache has significantly worsened in parallel with progression of the TMD
 - b. Headache has significantly improved or resolved in parallel with improvement in or resolution of the TMD
 3. The headache is produced or exacerbated by active jaw movements, passive movements through the range of motion of the jaw, and/or provocative maneuvers applied to temporomandibular structures such as pressure on the TMJ and surrounding muscles of mastication
 4. Headache, when unilateral, is ipsilateral to the side of the TMD
- D. Not better accounted for by another International Classification of Headache Disorders-3 diagnosis

Abbreviations: TMD, temporomandibular disorder; TMJ, temporomandibular joint.

From The Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, 3rd edition (beta version). *Cephalgia* 2013;33(9):765; with permission.

central sensitization and decrease in pain thresholds in migraine patients.¹⁴ Also, parafunctional habits and associated painful TMD greatly increases the risk for chronic migraine.^{15,16} Furthermore, genetic¹⁷ and hormonal associations have also been made. Sex hormones, such as estrogen, may help to control trigeminal nerve sensitization by modulating nociceptive mediators such as calcitonin gene-related peptide (CGRP).¹⁸

EPIDEMIOLOGY OF HEADACHE AND TEMPOROMANDIBULAR DISORDERS COMORBIDITY

TMD epidemiology in nonpatient populations showed the prevalence of 1 joint dysfunction (clicking, limited range of motion) in 75% of patients. One symptom (pain or pain with palpation) occurred in 33% to 39% of patients. Painful TMD was present in 10% to 25% of the population, but fewer than 7% of patients required treatment. The presence of headache in TMD patients was 27.4% versus 15.2% in non-TMD patients.^{1-3,12} Headache is more likely to be in myogenous TMD than arthrogenous TMD,¹³ and chronic headache patients are more likely to meet Research Diagnostic Criteria/TMD criteria for myofascial pain^{19,20} (**Box 1**).

Because TMD and headache occur frequently together in the young female population, assessing their relationship is difficult. There are, however, a number of studies suggesting the comorbidity is more than just coincidence. When assessing the prevalence of TMD in a headache population, it was described that 56.1% of headache patients had TMD. This percentage increased if the study population had both migraine and tension-type headache.²¹ If the population is limited to females, 86.3% of migraine and 91.3% of chronic migraine patients had TMD. The TMD was more likely to be myogenous than arthrogenous.²² Evaluating headache in a TMD population, the presence was 85.5%. Compared with a non-TMD control where the prevalence was 45.4%.²³

Considering the presence of TMD in the various types of primary headaches, chronic migraine was most common (odds ratio, 95.9; $P < .01$; 95% CI, 12.5–734.64), followed by episodic migraine (7.0), then episodic tension-type headache (3.7). Painful TMD alone was associated with significant risk of chronic migraine (30.1) and episodic migraine (3.7), whereas the presence of sleep bruxism alone was not a significant risk factor for primary headaches. Compared with painful TMD and sleep bruxism individually, the combination of both

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