

UDK 616.716.1:616.857

Review

Received: 22 January 2010

Accepted: 17 March 2010

TEMPOROMANDIBULAR DISORDERS AND MIGRAINE HEADACHE

Vida Demarin, Vanja Bašić Kes

Department of Neurology, Sestre milosrdnice University Hospital, Zagreb, Croatia

Summary

Migraine headache and temporomandibular disorders show significant overlap in the area or distribution of pain, the gender prevalence and age distribution.

Temporomandibular disorders may cause headaches *per se*, worsen existent primary headaches, and add to the burden of headache disorders.

The patients with combined migraine and tension-type headaches had a higher prevalence of temporomandibular disorders.

Evidence supporting a close relationship include the increased masticatory muscle tenderness in migrainers compared and improvement in headache symptoms with traditional TMD treatment.

Key words: temporomandibular disorders; migraine headache.

HEADACHE

Headache is the most common neurological symptom encountered in primary care, and also in general neurological practice. In most cases there is no serious underlying cause. Recurring headaches occur in 76% of women and 57% of men [1,2]. The incidence of headache is 39% at age six and increases to 70% by 15 years of age. [1] Headache afflicts a large portion of the population and with its varying severity can result in discomfort, disruption of daily activity, and occasionally debilitating pain. Although about 30% of headache sufferers are periodically functionally impaired, many do not seek medical care [3].

Migraine is a familial paroxysmal neurological disorder characterized by spontaneous or triggered attacks of headache that are variably associated with autonomic disturbance like nausea or pallor, heightened sensitivity to external stimuli (scotoma, paraesthesiae, dizziness) and less often signs as hemiparesis or aphasia. The attacks usually last 4-72 hours. Migraine headaches affect 18% of

women and 6% of men, although its onset is within the first three decades of life. Migraine greatly affects quality of life. The World Health Organization ranks migraine among the worlds 20 most disabling medical illnesses.

Family physicians and specialists in neurology seek to rule out an organic cause of primary and secondary headache. Unfortunately, the difficulties in distinguishing headaches based on clinical presentation rarely lead to the uncovering of an organic etiologic factor, and rarely lead to the diagnosis of comorbid conditions such as TMD. This results in frequent empiric management of headache without the evaluation of TMD as a potentially treatable comorbid condition [2].

Genetic factors play an important role in the development of migraine headaches, with 70-90% of patients having a positive family history for migraine. Traditional concepts regarding the pathogenesis of headache crudely separated this disorder into the muscle contraction theory of tension-type headache and the vascular theory of migraine.

Current concepts point to both a neurogenic theory and the role of serotonin in migraine. This neurogenic theory of migraine proposes that the pain originates in the structures of the brain, affecting ascending and descending pathways. In addition, a primary neuronal event is followed by secondary vascular changes whereby, neuronal activation, vascular dilation, and muscle spasm all promote and propagate head pain. The very core of these disturbances appear to be channel dysfunction leading to neuronal hyperexcitability.

Although many forms and variants of migraine headache exist, many of them demonstrate specific phases including a prodrome, aura, headache, and postdrome or recovery.

Tension-type headache, including pain generating from the masticatory musculature, can be episodic as well as chronic and may be indistinguishable clinically and therapeutically from migraine. It is likely that some tension-type headaches and correspondingly some TMDs represent a variant form of migraine or they have a migrainous component to them. The possibility is expressed more clearly by looking at the difference between tension-type headache and migraine as a continuum of the same pathophysiologic.

TEMPOROMANDIBULAR DISORDERS

Temporomandibular disorders (TMD) are among the most common orofacial pain conditions of nondental origin. The reported prevalence of TMD differs between studies, probably because of variations in methodology and definitions

of TMD. The prevalences of TMD symptoms and signs are apparently also high in non-patient populations.

Although there are no racial or ethnic differences in the prevalence of TMD, there is a significant gender predilection. The prevalence of TMD in males has been reported to be 3.2-10% and 6.3-14% in females. The highest association is in women in their reproductive years with a declining prevalence after the age of 45. In addition, women are significantly more likely to experience disability due to TMD and represent over 80% of patients treated for TMD.

The most common symptom of TMD is clicking of the TMJ, the prevalence levels varying from 8 to 50 %. In contrast, mouth opening limitations are relatively rare, occurring in 5 % or less of the population.

Pain in the face and the TMJs is a common symptom of TMD, and supposed to be the most important reason for seeking treatment for. It has been suggested that TMD pain occurs with about the same prevalence as abdominal pain and chest pain, but is less common than back pain and headache [4-7].

There are two distinct disorders affecting the temporo-mandibular complex; temporo-mandibular joint articular disorders including congenital or developmental conditions, disc derangement disorders, dislocations, inflammatory disorders, and osteoarthritic disorders and masticatory muscle disorders particularly myofascial pain, myositis, myospasm, and myofibrotic contracture [8-10].

Mechanical stimuli, including bruxism and clenching of the teeth along with myogenic pain of the masticatory muscles may provide the stimulus for the release of serotonin and norepinephrine from the dorsal raphe and locus ceruleus of the brain, setting off a cascade of events leading to migraine headache and further muscle tension. Recent papers have suggested that a common factor to migraine and tension-type headaches may be chronic clenching and that dentists may be able to treat headache patients more effectively than previously suspected through the use of a dental appliances [11].

The link between migraine headache and TMD can be best proven by comparing and contrasting these disorders based on the most common parameters to evaluate diseases, namely epidemiologic characteristics, locations of pain, comorbid diseases, presumed etiologies, clinical manifestations, and therapeutic intervention.

MIGRAINE AND TEMPOROMANIBULAR DISORDERS

Migraine headache and TMD are both characterized by pain in the head and/or face and both conditions are more common in women, particularly in

their child-bearing years. Migraine headache affects 17-18% of women and 6% of men; while TMD affects up to 10% of men and up to 14% of women. Women represent greater than 80% of all TMD patients and a majority of headache patients partly because of their increased likelihood of seeking care.

Due to the close anatomical relationship of the muscles of mastication and TMJ to the head and due to the frequency of referred pain, it is sensible to theorize that there is a significant percentage of patients with headache actually have TMD as the major source of their pain. The literature suggests that there is a relationship between both intracapsular articular disorders as well as disorders affecting the masticatory musculature [2,12-14]. Migraine pain often manifests in areas of the head including the TMJ and masticatory muscles [15-21].

DeRossi et al. demonstrated the relationship of TMD and headache, showing a significantly higher prevalence of TMD in patients presenting to a neurology clinic for headache than a control population (11/13 of headache patients versus 1/22 of control patients), [5]. These results suggest a subset of patients referred to a neurologist for headache may in fact have a previously undiagnosed TMD as the source of their complaint and a significant subset of patients with migraine headache have TMD as a comorbid disease.

Interestingly, for reasons that are not completely understood, a number of coexisting conditions have been linked to migraine, including asthma, chronic fatigue syndrome, hypertension, Raynaud's phenomena, stroke, anxiety disorders, depression, and mood disorders. Although these conditions are more common in individuals with migraine, it is unclear what if any causal relationships exist. A few studies in the literature have demonstrated a relationship between temporomandibular disorders (TMD) and various types of headache, including vascular headaches. According to Haley, these studies resulted from the clinical observation that patients with TMD also frequently suffer from headache [18].

The relationship between temporomandibular disorders and headache is well recognized in the literature. For instance, some patients diagnosed with either migraine or tension-type headaches, which may be caused by myalgia of the temporalis muscle, will have signs and symptoms consistent with TMD [16,18,22].

Strengthening this relationship between TMD and headache is the fact that treatment of TMD has resulted in a decrease of symptoms of headache in some patients [22]. Despite an obvious lack of a well-designed longitudinal study that irrefutably confirms the relationship between headache and TMD, a clinical correlation can be seen. In addition, recent evidence suggests that patients who have a diagnosis of vascular or migraine headache have a higher prevalence of

TMD, as a contributing cause of their pain, than the general population. In addition, although myalgia of the masticatory muscle accounts for a majority of the TMD, intracapsular disorders are associated with vascular headache compared to controls.

There is a growing belief that primary headaches such as tension-type headache and migraine represent a continuum of the same physiologic process. A convergence hypothesis has been proposed suggesting that successive symptoms experienced clinically actually reflect an escalating pathophysiologic process, beginning with a premonitory period and progressing into tension-type headache and, if left uninterrupted eventually into migraine. In addition, components of a TMD, including bruxism, myalgia, or an intraarticular disorder may represent a mechanical trigger, similar to chemical and psychological triggers, known to precipitate a migraine headache.

THERAPY

The therapy of TMD and migraine usually involves a multidisciplinary approach for maximum benefit. Both conditions have many similarities.

Non-specific drugs such as analgetics, non-steroidal anti-inflammatory drugs and opioids may control the pain of migraine.

Specific drugs such as the triptans and ergots, are effective for the treatment of migraine headache attacks but are not useful for other pain disorders. Triptans are usually not recommended during the aura phase of an attack, nor are they used in patients with complex auras (sensory, motor, speech). They are contraindicated in hemiplegic migraine, and should be avoided in patients with coronary heart disease, previous stroke or uncontrolled hypertension.

Noninvasive therapies for therapies for headache include physical therapy, relaxation techniques, and diet modification and now recently the suggestion of interocclusal orthotic treatment to suppress the nociceptive-trigeminal system.

For TMD, pharmacologic and non-pharmacologic therapies are employed. Initial TMD treatment often involves physical and cognitive awareness measures, stress reduction, occlusal therapy, and medications including tricyclic antidepressants, anxiolytics, and neuroleptic medications commonly used in the treatment of migraine.

References

- [1] *Saper JR* (Ed). *Clinician's Manual on Headache*. Philadelphia: Science Press. 1995.

- [2] *Schiffman E, Halet D, Baker C, Lindgren B.* Diagnostic criteria for screening headache patients for temporomandibular disorders. *Headache.* 1995;35:121-4.
- [3] *Bevilaqua Grossi D, Lipton RB, Bigal ME.* Temporomandibular disorders and migraine chronification. *Curr Pain Headache Rep.* 2009 Aug;13(4):314-8.
- [4] *Lipton JA, Ship JA, Larach-Robinson D.* Estimated prevalence and distribution of reported orofacial pain in the United States. *J Am Dent Assoc.* 1993;124:115-21.
- [5] *DeRossi SS, Greenberg MS, Sollecito TP, Detre JA.* A prospective study evaluating and analyzing the presence of temporomandibular disorders (TMD) in a cohort of patients referred to a neurology clinic for evaluation and treatment of headache. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2000;89:443.
- [6] *DeKanter RJAM, Truin GJ, Burgersdijk RCW, et al.* Prevalence in the Dutch adult population and a meta-analysis of signs and symptoms of temporomandibular disorders. *J Dent Res.* 1993;72:1509-18.
- [7] *Dworkin SF, Huggins KH, LeResche L, et al.* Epidemiology of signs and symptoms in temporomandibular disorders: Clinical signs in cases and controls. *J Am Dent Assoc.* 1990;120:273-81.
- [8] *Dworkin SF, LeResche L.* Research diagnostic criteria for temporomandibular disorders: review, criteria, examination and specifications, critique. *J Craniomand Disord.* 1992; 6:301-55.
- [9] *Schiffman EL, Friction JR, Haley DP, Shapiro BL.* The prevalence and treatment needs of subjects with temporomandibular disorders. *J Am Dent Assoc.* 1990;120:295-303.
- [10] *Parker MW.* A dynamic model of etiology in temporomandibular disorders. *J Am Dent Assoc.* 1990;120:283-9.
- [11] *Shankland WE.* Nociceptive trigeminal inhibition--tension suppression system: a method of preventing migraine and tension headaches. *Compend Contin Educ Dent.* 2002 Feb;23(2):105-8, 110, 112-3; quiz 114.
- [12] *Williamson EH.* Interrelationship of internal derangements of the temporomandibular joint, headache, vertigo, and tinnitus: a survey of 25 patients. *Cranio.* 1990;8:301-6.
- [13] *Quayle AA, Gray RJ, Metcalfe RJ, Guthrie E, Wastell D.* Soft occlusal splint therapy in the treatment of migraine and other headaches. *J Dent.* 1990;18:123-9.
- [14] *Steele JG, Lamey PJ, Sharkey SW, Smith GMR.* Occlusal abnormalities, pericranial muscle and joint tenderness and tooth wear in a group of migraine patients. *J Oral Rehabil.* 1991;18:453-8.
- [15] *Schokker RP, Hansson TL, Ansik BJJ.* Craniomandibular disorders in patients with different types of headache. *J Craniomand Disord Facial Oral Pain.* 1990;4:47-51.
- [16] *Schellhas KP, Wilkes CH, Baker CC.* Facial pain, headache, and temporomandibular joint inflammation. *Headache.* 1989;29:228-31.

- [17] *Lapeer GL*. Reduction of the painful sequela of migraine headache by use of the occlusal diagnostic splint: an hypothesis. *Cranio*. 1998;6:82-6.
- [18] *Haley D, Schiffman E, Baker C, Belgrade M*. The comparison of patients suffering from temporomandibular disorders and a general headache population Headache. 1993;33:210-13.
- [19] *Graff-Radford SB*. Oromandibular disorders and headache. A critical appraisal. *Neurologic Clinics*. 1990;8:929-45.
- [20] *Flaherty TJ*. The cyclic nature of TMD, the headache patient, and the functional treatment rationale. *Functional Orthodont*. 1994;11:36-9.
- [21] *Clifford T, Lamey PJ, Fartash L*. Mandibular tori, migraine and temporomandibular disorders. *Br Dent J*. 1996;180:382-4.
- [22] *Schokker RP, Hansson TL, Ansik BJJ*. Differences in headache patients regarding response to treatment of the masticatory system. *J Craniomand Disord Facial Oral Pain*. 1990;4:228-32.

Sažetak

Temporomandibularni poremećaji i migrenska glavobolja

Migrena i temporomandibularni poremećaji imaju mnogo zajedničkog. Obje vrste poremećaja javljaju se u mlađoj životnoj dobi, češće u osoba ženskog spola, a i distribucija boli slična je.

Temporomandibularni poremećaji mogu biti jedan od uzroka glavobolje ili mogu pogoršati primarnu glavobolju.

Prevalencija temporomandibularnih poremećaja češće se javlja u bolesnika koji imaju kombinaciju migrenske i tenzijske glavobolje.

Bolesnici s migrenskom glavoboljom češće imaju napetost mastikatornih mišića, a do poboljšanja dolazi nakon što budu liječeni istim metodama kao i bolesnici s temporomandibularnim poremećajima.

Ključne riječi: temporomandibularni poremećaji; migrena.

Corresponding author:
Vida Demarin
e-mail: vida.demarin@zg.t-com.hr

