

Temporomandibular Disorder

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Prevalence of temporomandibular disorder (TMD)

The Nuprin Pain Report showed that the major health complaint in the USA was pain (88%)¹⁸. In the same US population, recurrent or persistent orofacial pain (not including ‘toothache’) has been estimated to occur in 6-12% of people, with a similar figure of 5% of the population in the Netherlands. The variability in the US figures is probably related to the respective investigators adopting different diagnostic criteria in achieving a firm diagnosis of temporomandibular disorder (TMD). Other names ascribed to this condition include Costen’s syndrome, temporomandibular joint dysfunction, and craniomandibular disorder. TMD is characterised by a complex of signs and symptoms, with orofacial pain as a main symptom. TMD is the most common orofacial pain disorder but its prevalence varies between studies, due likely to age-related differences in the groups analysed. One survey reported the prevalence of TMD symptoms or signs to occur in 70-80% of young adults. TMD is usually associated with a predilection for females in the 18-35 year age group. In this group, TMD is usually of limited duration (days to weeks) and it is often recurrent because ‘stress’ is a prime causal factor. Nearly 2% of the population seek treatment for their symptoms. However, it should be noted that Vickers et al. have shown that TMD occurs in another targeted age group (45-60 years); patients referred to a medical multidisciplinary pain centre reported chronic ‘persistent’ pain, in contrast to ‘recurrent’ pain. No definitive reason has been established for ‘persistent’ pain, although there is compelling evidence to indicate that one cause is muscle spasm secondary to neuropathic orofacial pain, and thus, the consequent development of a TMD.

TMD may exist as a distinct entity or in association with other orofacial pain conditions. There have been several causal factors attributed to the onset of TMD as a sole condition. Variation from a ‘normal’ occlusion and associated occlusal patterns is one suggestion. The treatment for occlusal disharmony has included equilibration of the occlusal surfaces of teeth. One long term study of children and



adolescents showed that occlusal adjustment versus mock adjustment was associated with a reduced risk of symptomatic TMD. In contrast, a longitudinal study of 361 Japanese schoolgirls found that specific types of malocclusion were not predictive of TMD but that temporomandibular joint (TMJ) noises were predictive of the progression to TMJ pain.²⁷ Tooth / skeletal discrepancies are more likely to be causative of TMD. For example, a Class II malocclusion (underdevelopment of the mandible) may cause the patient to repeatedly extend the mandible forward enabling the incisors to bite through food. Consequently, however, this constant overextension of the muscles of mastication causes

pain. Other myofascial pain of these muscles results from bruxism (jaw clenching and the grinding of teeth). Bruxism is very frequently associated with concomitant anxiety and stress. Joint clicking, while a common sign in patients with TMD, lacks specificity for a diagnosis. Dolwick et al. found joint clicking strongly correlates with disc displacement from radiographic assessment, but clicking is evident in 30-50% of asymptomatic people.

Symptomatology

Due to the diverse nature of TMD symptomatology, many patients end on a circuitous route of doctors and dentists. Unfortunately, diagnosis of this state is often delayed unnecessarily as the patient may be concerned about one or two predominant symptoms such as tingling or numbness in the face. If these were the only symptoms then this warrants neurological assessment, however, if a more complete history is taken then a diagnosis of TMD can be elicited. The following lists the frequency of signs and symptoms in a group of patients with TMD referred to a pain centre.

The table lists the frequency of signs and symptoms in a group of patients (n=30) diagnosed with TMD of long duration (female : male, 21 : 9; age range 24-84 years, mean = 45 years; duration of pain 4 months-23 years, mean = 6 years) (Vickers ER & Cousins MJ, 1994).

Signs and symptoms	Frequency (%)
Pain in the face / jaw region	89
Neck pain	78
Headaches / earaches	78
Clicking of the jaw joint(s)	68
Muscle tension in the jaw region	68
Restricted opening of the jaw	64
Difficulty in chewing	61
Toothache / tooth sensitivity	54
Dizziness	50
Bruxism	50
Sore tongue / gums	46
Locking of the jaw	46
Swelling in the face /mouth	43
Difficulty in breathing through the nose	43
Tinnitus	39
Tingling sensation in the face	39
Numbness in the face / mouth	36
Unpleasant taste	21
Teeth chipping / wearing down	14

Diagnosis

Diagnosis of TMD is made by obtaining a detailed pain and psychosocial history, patient self-report of his/her symptomatology, radiographs / CT / MRI, and a clinical examination. A simple screening examination for assessing TMD includes: (i) measurement of the pain-free and maximal range of mandibular opening and lateral excursions, (ii) palpation of the TMJ for tenderness, (iii) obvious TMJ clicking or crepitus, (iv) palpation of masseter and temporalis muscles for tenderness, (v) presence of excessive occlusal wear, chipped teeth, fractured dental restorations, and (vi) measurable differences in facial / jaw asymmetry. In addition, the close association of anxiety / stress with TMD warrants referral for psychological assessment.

Management

Where it is suspected that pain may arise from pathology of the joint itself then the pain is usually continuous, increases in intensity with movement of the jaw, and is centered in the joint. This is indicative of arthritic changes or malposition of the cartilaginous disc (meniscus). The diagnosis and treatment of a 'locked disc', usually in the anterior position, is controversial. The validity of arthrography and MRI to diagnose disc displacement has been questioned. Dolwick et al. showed 30% of asymptomatic subjects to have evidence of disc displacement using arthrography and MRI. Furthermore, in bilateral arthrograms of unilateral symptomatic TMD patients, disc displacement was evident in 88% of patients on the asymptomatic side. Invasive treatment of a locked disc is equally contentious and procedures include arthroscopy and open joint surgery. In contrast, there is a good prognosis for many patients when given simple reassurance as to the nature of the condition. Kurita et al.³⁶ examined 40 patients (38 females, 2 males) aged from 13-68 years with TMD arising from a displaced disc. Patients underwent a clinical exam, MRI assessment, and rated his / her pain intensity (VAS). Patients were simply told that the "condition was benign and had a favourable prognosis". The results at 2.5 yrs showed 42.5% were asymptomatic, 32.5% had improved, and 25% remained symptomatic.

Fortunately, the majority of patients with TMD patients have the condition infrequently brought on by bruxism and associated background stress situations. These episodes usually last for only several weeks. The treatment of intermittent TMD includes simple analgesics (paracetamol, NSAIDS), benzodiazepines, physiotherapy (ultrasound, jaw and neck extension exercises), reassurance, and investigation of mitigating factors such as background stress and anxiety. Topical NSAIDS have been shown to be effective in reducing jaw muscle soreness in the experimental situation. Other simple techniques include acupuncture and low level laser therapy. Many dental practitioners advocate the use dental occlusal splints. These removable appliances are indicated when bruxism is causing attrition to the occlusal and incisal surfaces of the teeth, in order to prevent the unnecessary loss of tooth enamel. Some patients report a benefit from splints by a reduction in pain intensity, and some dentists claim these devices are almost a panacea for all forms of ailments. The following section details the some of the best evidence of the efficacy of splint therapy.

Dental occlusal splint therapy

Removable dental appliances (occlusal splints) are often used for the treatment of TMD. While they are useful in preventing loss of enamel (attrition), and subsequent loss of vertical dimension between maxilla and mandible, there is a great deal of empirical evidence claiming pain reduction, and a paucity of evidence based treatment using controls and randomisation. Results from the few controlled studies have produced conflicting evidence as to the efficacy of splints. One controlled study showed splint therapy to be beneficial and only nocturnal wearing of the device was considered necessary. However, Dao et al. carried out a well designed, controlled study where patients (n=63) were randomly assigned to one of three groups: (i) passive control - splint worn only at appointment time (30 min), (ii) active control - splint did not contact occlusal surfaces of teeth, worn 24 hr/day, and (iii) active treatment - splint contacted occlusal surfaces of teeth, worn 24 hr/day. Each patient was seen at 7 visits over 10 weeks and pain intensity was measured by visual analogue scales (VAS), and quality of life indices were assessed. At 10 weeks, all groups improved in pain reduction and quality of life, and there were no significant differences. Thus, in a well designed trial examining the efficacy of occlusal splints for TMD that occurs in most of the population (i.e. on a single or infrequent basis) then no significant benefit was noted. However, if splints are to be issued to the patient by the patient's dentist to prevent tooth attrition then expert construction and dental review of the devices are needed, as there is the possibility of iatrogenic damage from a poorly fitting device.



Persistent TMD

In some patients, the pain may unfortunately persist for months and years, usually from maintaining a bruxing habit. Managing this form of TMD encompasses a multidisciplinary approach, and a priority is drug rationalisation where benzodiazepines and analgetic agents containing codeine are discontinued. Where there is sleep disturbance, low dose tricyclic antidepressant medication at night is indicated as its sedation effects can be used for a therapeutic advantage.

Other aspects of the multidisciplinary approach include physiotherapy (muscle extension exercises) that should be maintained at home in the long term, psychological strategies, and dental occlusal splint therapy where justifiable. TMD may also occur in association with other pain conditions. For example, 70% of patients diagnosed with “fibromyalgia” reported orofacial pain. On a psychological basis, “whiplash” patients with TMD were found to have higher somatisation scores, be more distressed, and respond less well to TMD orientated therapy than the average TMD patient, despite having similar symptoms. Changes in reported pain intensity do not correlate with a change in the signs of pathology of the TMJ. Single modality approaches, i.e., physical or psychological treatments only, are unsatisfactory in assessing and treating TMD. For example, psychosocial factors at presentation do not predict outcome of initial treatment for TMD. Several leading investigators have argued that the psychophysical approach be implemented for the classification, diagnosis and treatment of TMD.

Patient case study 1

The patient was a 35 year old male who reported left sided jaw pain for 6 years that was spreading to other areas of the body. He had consulted several different practitioners including an orthodontist, physiotherapist, and ENT surgeon, but had no firm diagnosis for his problem.

He reported that his many symptoms was a worry for him ("what is wrong with me") and he avoided physical activity as it made the pain worse. Heat applications, being busy and positive thoughts reduced the pain. He was uncertain about the cause of the pain but thought stress may have been a contributing factor. He described the typical sensory pain qualities of TMD of severe aching and cramping and it had a pain intensity of 6/10.

He was advised to have physiotherapy and increase physical activity. In addition, he was relieved to have a diagnosis and commence stress reduction strategies. Here is a copy of part of one of his questionnaires.

Quality of your pain	not present	mild	moderate	severe
throbbing	④	①	●	③
shooting	●	①	②	③
stabbing	④	●	②	③
sharp	④	●	②	③
cramping	④	①	②	●
gnawing	④	①	②	●
hot-burning	④	①	●	③
aching	④	①	②	●
heavy	④	①	②	●
tender	④	①	●	③
splitting	④	①	●	③
tiring-exhausting	④	①	②	●
sickening	④	①	●	③
fearful	④	①	●	③
punishing-cruel	④	①	●	③

Patient case study 2

A 22 year old female reported a 2 year history of pain. The following description by her shows some of the features of TMD. The pain had originated in both temporomandibular joints (marked by X in front of the ears). However, the condition had been untreated for 2 years and the area of pain spread to include the face, neck, shoulders, arms and back by the time she was referred to the pain clinic. A malocclusion was the cause and the pain was affecting her work and there was a decline in her social activities. She was referred to an orthodontist for correction of the malocclusion and was advised to increase her social activities despite the current pain.