hyper-trophy and abnormal occlusal wear resulting from oral parafunctional activities such as bruxism may be related problems.1

Anatomical, neurologic, physiologic and psychologic factors can, alone or in combination, be sufficient to disrupt this balance; thus reducing the adaptive capacity of the masticatory system with subsequent expression of symptoms of TMD.2

Epidemiology, the study of the distribution and determinants of health-related states and events in populations, should have a definitive application to the problem in question. Epidemiologic studies related to TMD have been primarily focused on prevalence and the associated signs and symptoms of the disorder. These studies are cross-sectional samples, meaning they are not necessarily representative of the general population. Therefore, one cannot make a case-specific basis be questioned.

Signs and symptoms of TMD are very common in the general population. The prevalence of 75% of the general population have at least one sign of TMD (joint noise, tenderness, etc), 33% of the general population have joint noise, and 13% have joint tenderness.26–28

Importantly, this trend is significant gender differences in the TMD population exist. Historically, TM disorders have been linked to enhanced inflammatory process activities and free radical formation, including magnesium and B vitamins.40

Signs and symptoms of TMD are more prevalent in the third or fourth decade of life.2,4

Studies related to the severity of pain between age groups have demonstrated no difference across all age groups.3,4 However, the frequency of the morphologic changes and a marked continuous decrease in signs and symptoms is observed with advancing age.5

Data indicate that significant gender differences in the TMD population exist. Importantly, this trend is observed in most chronic pain conditions. Factors that must be taken into consideration are behavioral factors such as the more stoic nature of males; social conditioning and care seeking behaviors have been proposed as possibly being responsible for the gender differences. Physiologic factors related to hormonal influences are also reported. A natural tendency is for females to exhibit a greater potential of masticatory muscle fatigue has been suggested. This phenomenon has been attributed to a greater incidence of a slow twitch, easily fatiguing white fibers versus slower twitch, endurant red fibers in females.6–8 Recent data also suggests that females demonstrate a greater pain sensitivity during the menstrual cycle, at ovulation, and following menses. Functional estrogen receptors have been identified in most synovial joints of males and females in equal concentrations, and there exists a significant difference in the number of estrogen receptors within the TM joint. Male TM joints have been found to have few, if any, estrogen receptors which may be related to the differential significant numbers of these receptors.8,9

Psychosocial factors have been proposed to be related to TMD experience. The relationship of the psychologic factors either directly or indirectly as causative must be determined on a case-specific basis. Catastrophic thinking, or the biological tendency is for females to exhibit a greater tendency to dwell on, amplify and over interpret somatic symptoms.39

Sleep bruxism is reported by 8% of adults.10–13 Studies related to the severity of pain between age groups have demonstrated no difference across all age groups.3,4 However, the frequency of the morphologic changes and a marked continuous decrease in signs and symptoms is observed with advancing age.5

A relationship between a history of physical and/or sexual abuse and a range of psychological, functional, and physical factors has been suggested. Abuse history has been identified as a significant feature of TMD chronic and aiding in the production of antioxidants, which limit the damage caused by free radicals in both joints and muscles. Additionally, vitamin deficiencies have been linked to enhanced inflammatory process activities and free radical formation, including magnesium and B vitamins.40

The importance of sleep has been underestimated by the majority of the population; 65% of American adults do not obtain the recommended amount of daily sleep. Sleep is a basic human need, and must be considered as important as diet and exercise. Getting the right amount of sleep is vital, but just as important is the quality of our sleep. Sleep disturbances have been reported in many epidemiological studies in persons experiencing not only acute but also chronic pain.31–34 Sleep disturbances have been related to a multitude of factors including bruxism. Sleep disturbances are more prevalent in the third or fourth decade of life.3

The role of various types of trauma in the etiology of TMD has been debated for many years. Trauma is described as any force applied to the mastication structures that exceeds that of the body's natural range. Factors such as intensity and duration must be considered. Most trauma can be divided into three types: direct trauma (the result of a sudden and usually isolated blow to the structures), indirect (sudden blow without direct contact), micro-trauma (the result of pro-longed, repeated forces over time due to parafunctional habits or adverse loading through postural imbalances).

Trends in structural failure, loss of function may follow. Stretching, twisting or compressing forces during eating, yawning, yelling or prolonged mouth opening have also been reported to trigger or aggravate TMD.40

The results of several studies indicate that the majority of TMD cases are of gradual and mostly unperceived onset of their symptoms, likely related to micro-trauma or a repetitive stress injury. Long-term occlusal forces through grinding and clenching can lead to progressive occlusal breakdown.41

Some contributory etiologic factors are only risk factors, others are causal in nature, and others result from, or are related to these contributing factors. Some contributory etiologic factors are only risk factors, others are causal in nature, and others result from, or are related to these contributing factors.

Several studies have demonstrated that the presence of predisposing factors such as structural, metabolic and/or psychological conditions could be sufficient to increase the risk of developing TMD related problems if they are affecting the masticatory system in a negative way. It has been reported that an aversive or extreme anterior open bite, overjet greater than 6 to 7 mm, discrepancy between the retruded contact position and the intercuspal position greater than 4 mm, five or more missing posterior teeth, and unilateral maxillary posterior teeth may be associated with TMD.43

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reduction in the inhibitory controls while sleeping makes forces during nocturnal bruxism three to four times greater than during waking hours, forces that potentially exceed the normal capacity of the system. Sleep bruxism may eventually lead to many signs and symptoms of dysfunction, including pain, and/or structural changes to the masticatory system. It has been demonstrated that the metabolic activity of the brain significantly decreases after 24 hours of sustained wakefulness. A number of sleep-dependent activities have been recognized, leading to a better understanding of how sleep deprivation or interruption may result in a decrease in body temperature, a decrease in immune system function (T-cells and lymphocyte function), a decrease in the release of growth hormone (necessary for repair and regeneration of damaged tissues) and a reduction in serotonin (neurotransmitters involved in pain modulation and mood) in the central nervous system. A thorough sleep history must be obtained in all orofacial pain patients due to the significant implications of disrupted sleep and nocturnal bruxism.

Acceleration-deceleration injury (whiplash) with no direct blow to the face can cause symptoms consistent with TMD. However, a direct causal relationship between jaw symptoms and indirect trauma has yet to be established. Studies have failed to demonstrate a jaw movement to cause mandibular strain in flexion-extension type of injury.

The TMD examination requires a comprehensive approach understanding all potential factors. The physical examination should consist of a review of systems including not only a patient's actual chief concern(s), but also the chronological history, history of present illness(es), medical history, dental history, and personal history (social, family), general inspection of the head, neck and cervical spine, neurovascular evaluation, comprehensive orthopedic evaluation of the TM joints, evaluation and palpation of the masticatory and cervical muscles, gross screening of the cranial nerves, and intraoral evaluation of hard and soft tissues including occlusal analysis.

Basic assessment of all TMD patients should include behavioral and psychological screening by the dentist during the history-taking process. The history should include questions to evaluate behavioral, social, emotional and cognitive factors that may initiate, sustain or result from the patient’s condition. Consideration to relevant factors such as oral habits, signs of depression, anxiety, stressful life events, lifestyle, secondary gain, and overuse of healthcare should also be given. Imaging of the TM joint and orofacial structures may be necessary to rule out structural disorders, and must be prescribed primarily when the clinical examination suggests some form of disorder.

Heretofore clinical practice in the area of TMD has been based on anecdotal reporting. Individual and group interpretation of the limited scientific evidence has led to a marked variation in the philosophy of practice in this complex area. Empiricism and rationalism has at times resulted in disregard for the valid scientific evidence base that does exist. With the recent explosion of knowledge regarding pain mechanisms and pathways, the effect of pain on quality of life, and an enhanced appreciation for the multifactorial nature of TMD, today’s dentist can better apply science to the art of practicing evidence-based dentistry. Evidence-based dentistry is the conscientious, explicit and judicious use of current evidence to the art of practicing evidence-based dentistry. Evidence-based dentistry is the conscientious, explicit and judicious use of current evidence to the art of practicing evidence-based dentistry.

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