Temporomandibular disorders (TMD) are a collective term embracing a number of clinical problems that involve the masticatory musculature, the temporomandibular joint (TMJ), associated structures, or both that have many common symptoms. The term is synonymous with others frequently utilized such as masticatory pain and dysfunction syndrome, temporomandibular joint syndrome, and several disorders. Temporomandibular disorders are currently recognized as a major cause of non-dental pain in the orofacial region and are considered a subclassification of musculoskeletal disorders.

Classic signs and symptoms associated with TMD are pain in the masticatory region and contiguous areas to include, TMJ joint and masticatory and cervical musculature, muscle spasm, restriction of mandibular movement; and TMJ sounds (clicking, popping, crepitus). The pain is usually aggravated by chewing or other jaw function.

Commonly associated co-existing co-morbidity factors with TMD are headache, facial pain, ear and jaw ache. Non-painful masticatory muscle hypertrophy and occlusal wear resulting from oral parafunctional activities such as bruxism may be related problems.

A functional homoeostatic balance among the various components of the masticatory system must be maintained for long-term stability. In addition, there are other contributing factors that can disrupt this dynamic balance. 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 and resulting in a cumulative expression of symptoms of TMD.

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. Most of the studies are cross-sectional samples, meaning they are not necessarily representative of the general population. Therefore, their presence and absence on a specific basis must be questioned.

Signs and symptoms of TMD are very common in the general population. They suggest that 40 to 75% of the general population have at least one sign of TMD (joint noise, tenderness, etc.). 33% of the general population have at least one symptom (face pain, joint pain, etc.). 1,2,4 The prevalence of signs and symptoms of TMD in childhood has been assessed but tends to be significantly lower in adults. 1,2,11 Signs and symptoms years suggesting that either biologic, neurologic or psychologic factors unique to women in this period of life could increase the risk of developing or maintaining this condition. It has been long recognized that females demonstrate a greater pain sensitivity during the menstrual cycle, at ovulation, and following menopause. Functional estrogen receptors have been identified in most synovial joints of males and females in equal concentrations. A relationship between a history of physical and/or sexual abuse and a range of psychologic, functional, and physical factors has been suggested. Abuse history has been identified as a significant feature of TMD chronic pain patients populations as contrasted non-chronic TMD patients. Research have found that an abuse history was likely to increase an individual's tendency to dwell on, amplify, and over interpret somatic symptoms. 16,36

The value of proper nutrition intervention, particularly in patients living with chronic pain where withdrawal from normal daily activities may have compromised not only their mental well-being, but also their neurophysiologic well-being. Exercise on a regular basis boosts the body's natural pain defense mechanisms, enhancing the production of endogenous opioids (enkephalins, dynorphins, endorphins). Balanced nutrition can enhance the body's pain mechanism by maximizing anti-eicosanoid effects and aiding in the production of endogenous opioids such as the more stoic nature of males; that must be taken into consideration. This trend is observed in most populations. Importantly, differences associated with sex, such as the frequency of the morphologic difference in the number of estrogen receptors while female TM joints are found to have few, if any, estrogen receptors. 4 The role of various types of trauma in the etiology of TMD is more prevalent in the third or fourth decade of life. 1,11 Studies relate to the severity of pain between age groups have demonstrated no difference across all age groups. 1,2,14 However, the frequency of the morphologic changes and a marked continuous decrease in signs and symptoms is observed with advancing age. 1,2,14

Data indicate that significant gender differences in the TMD population exist. 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. Physiological 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 concentration of fast twitch, easily fatiguing white fibers, very low concentration of the slow-twitch, endurance red fibers in the females. 2,10 Recent data also suggest that females are more likely to have a decrease in the concentration of central nervous system neurotransmitters noradrenaline and serotonin. A decrease in these neurotransmitters is associated with impairment of endogenous pain inhibition and disrupted sleep patterns. Anxiety and stress have been found to cause compromise in the immune system, leading individual host resistance.

The literature has demonstrated that most of the management and treatment of TMD disorders has been based on belief systems and testimonials. Why so much confusion and disagreement about what constitutes proper diagnosis, treatment, and management. The role of various types of trauma in the etiology of TMD has been debated for many years.

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 extreme occlusal relationship, 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 or mandibular crossbite in children may be associated with TMD. 1,2,14

Some contributing etiologic factors are only risk factors, others are causal in nature, and others result from, or are purely coincidental to the problem. These factors are classified as predisposing, initiating (precipitating), and perpetuating (factors that interfere with the healing or enhance the progression) of a disease process. 16 The contribution of specific occlusal factors to the multifactorial etiology of TMD has been debated for many years, the relative contribu-

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Temporomandibular Disorders: Epidemiologic and Etiologic Considerations. Part I

Uliess A. Guzman & Henry A. Gremillion, U.S.A.

Historically, TM disorders have been on stage for confusion and disagreement about what constitutes proper diagnosis, treatment, and management.

The role of various types of trauma in the etiology of TMD has been debated for many years.

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functional loading. Factors such as intensity and duration must be considered, as a conclusion can be divided into three types: direct trauma (the result of a sudden and vigorous impact of the structures), indirect (sudden blow without direct contact), and mixed (the result of gradual stress). Over time, these functional habits or adverse loading through postural imbalances.

Features leading to structural failure, loss of function may follow in stretching, twisting, or compressing forces during eating, yawning, yelping, or prolonged mouth opening have also been reported to trigger or aggravate TMD. 14.15 The results of several studies indicate that the majority of TMD patients experience a more gradual and mildly unperceived onset of their symptoms, likely related to micro-trauma or a repetitive stress response. Masticatory activities include bruxing, clenching, postural dysfunction, and repetitive habits. Experimen- tally induced parafunction has shown to result in the same changes reported by those with TMD. 14.15

The importance of sleep has been underestimated by the majority of the population. 63% of Americans do not get the recommended amount of sleep to meet their basic human need, and must be considered as important as diet and exercise. Getting quality sleep is no longer just a night time event, but as just important in the quality of our sleep. Sleep disturbances have been reported in many epidemiologic studies in persons experiencing not only acute but also chronic pain. It is estimated that one in seven Americans suffers from some kind of sleep disorder. Sleep studies have shown that disturbed sleep has significant physical effects on the body such as increase in anxiety and psychological changes have been demonstrated. 14,15

Sleep bruxism is reported by 8% of the population and is mainly associated with rhythmic masticatory muscle activity, characterized by repetitive muscle contractions primarily during the REM stage of sleep. The reduc- tion in the inhibitory controls of the masticatory system while sleep makes forces during nocturnal bruxism 3 to 4 times greater than during waking hours, forces that potentially could lead to degeneration of the system. 14.15 Sleep bruxism may eventually lead to many signs and symptoms that help indicate the presence of muscle disorders.

Hereafter clinical practice in the area of TMD has been based on anecdotal reporting. Individual and group interpretation of the limited scientific evidence available is led to an unclear variation in the philosophy of practice in this complex area. Empiricism and personal bias has at times resulted in disregard for the valid scientific evidence-base that does exist. Collaboration between dental practitioners and other health care professionals is necessary. Also the presence of TMD is to be considered as a multifactorial disorder, with psychological and social factors contributing to the pathogenesis and progression of TMD, and must be considered in the treatment approach.

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