

## REVIEW ARTICLE

# THE IMPORTANCE OF GENERAL EXAMINATION IN TEMPOROMANDIBULAR DISORDER PATIENTS

### ABSTRACT

The Temporomandibular disorders or TMD is a less discussed topic in dentistry, as the diagnostic and treatment protocols are still controversial. The diagnosis is usually made when the patient reports with clicking or pain around the joint. But mandible, as part of the postural chain, also has some effect on the general health that needs to be addressed. The systemic symptoms like headaches, neck aches, spasm of the floor of the mouth, various otalgic symptoms etc has to be taken care of. But correlating these, facts for the diagnosis of TMD is very important. This helps to approach the TMD treatment in the perspective of multi disciplinary fashion.

**Key words:** Temporomandibular joint disorder, headaches, neck aches, posture imbalance

### Author:

<sup>1</sup> Meera Mathai

<sup>2</sup>Alana Paul

<sup>3</sup>Divya Nair

<sup>1</sup>Reader and Head

Dept. of Oral Medicine and Radiology  
Indira Gandhi Institute of Dental Sciences  
Nellikuzhi P. O., Kothamangalam 686 691, Kerala

<sup>2</sup>Senior Lecturer

Dept. of Oral Medicine and Radiology  
Indira Gandhi Institute of Dental Sciences  
Nellikuzhi P. O., Kothamangalam 686 691, Kerala

<sup>3</sup>Senior Lecturer

Dept. of Oral Medicine and Radiology  
Indira Gandhi Institute of Dental Sciences  
Nellikuzhi P. O., Kothamangalam 686 691, Kerala

### Corresponding author

Dr. Meera Mathai

Reader and Head

Dept. of Oral Medicine and Radiology  
Indira Gandhi Institute of Dental Sciences  
Nellikuzhi P. O., Kothamangalam 686 691, Kerala  
Email: drmeeramathai@igids.org

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## INTRODUCTION

Temporo Mandibular Disorders or TMDs are defined as a subgroup of craniofacial pain problems that involve TMJ, masticatory muscles and associated head and neck musculoskeletal structures.<sup>1</sup> TMDs are classified as one subtype secondary headache by International Headache Society in International Classification of Headache disorders II.<sup>2</sup> In 2008, The American Academy of Orofacial Pain has expanded on this classification.<sup>3</sup> TMD itself is thought to by many as a psychological condition.<sup>4</sup> But in reality it is a physical, structural and mechanical problem affecting muscular, skeletal and endocrine systems. Hence TMD may exist as a distinct entity or associated with Orofacial pain conditions.

Dentist usually makes a diagnosis of TMD in patients present with pain around joint, limited mouth opening, asymmetric mandibular movement and clicking or crepitus sounds around joints. Except pain, all other symptoms goes unnoticed by the patient which makes the treatment delay. But the general health of the patient needs to be addressed also as TMDs has an impact on general health too. This article mainly emphasizes the importance of general examination in the diagnosis of TMD and how doctors can helps to improve the quality of life in these patients.

### Headaches

Headaches are the most common symptoms of TMD several studies in adults have shown a strong association between TMD and headaches and a reduction in headaches has been reported after the treatment of TMD. Headaches attributed to TMD are usually prominent in preauricular areas of face, masseter muscles and/or temporal regions. These headaches tend to be unilateral when TM complex is the generator of pain but may be bilateral in case of myogenic involvement.<sup>5</sup> In adult, an association is usually considered to exist between TMD and Tension type headaches. Both TMD and headaches are more common in women especially around 35-40yrs of age than men even though a recent study showed a positive correlation between these two irrespective of age and gender.<sup>6</sup> Mandibular deviation from midline is also shown to be greater in TMD patients with headaches with 0-14% in normal individuals and 5-43% in TMD patients.<sup>7,8,9,10</sup> The most important theory proposed for TMD involvement in headaches pain is

that it can occur as a result of dysfunctional masticator system. It has been hypothesized that any stage of TMD internal derangement can cause secondary muscle disorder due to altered disc/condyle relationship. This may result in tension type headaches with pericranial tenderness because of the involvement of temporalis muscles.<sup>11</sup>

### Neckaches

The neck is considered in the conduct to and from the body. The TMJ makes muscular and ligamentary connections to cervical regions forming a functional complex called cranio cervical mandibular systems. Hence the dysfunction within the neck structures commonly leads to problems in the jaw and vice versa. The most common cause of neck pain results from the weakened muscle and poor posture. Cervical disarrangement leads to non- alignment or disarticulation of TMJ. In such cases, the joint did not work properly during the function and therefore the neck muscles which are associated with the muscles of mastication undergo spasm. The spasm of scalene and trapezius muscles will cause the compression of nerves and vessels which lay near brachial plexuses of nerves at the back of neck that causes tingling or numbness of hand or fingers. Several studies shows that TMD patients presents with excessive forward head position, usually associated with shortening of posterior extensor muscles [suboccipital, semispinalis, splenii and upper trapezius muscle], as well as shortening of sternocleidomastoid (SCM). Anterior displacement of head lowers the field of vision and in order to improve, cervical lordosis increases. Many muscles of anterior neck controls jaw and tongue. Pain in these muscles will be referred to face and teeth and can causes difficulty in swallowing. Additionally the nerves that innervates jaw muscles and TMJ commingles with the nerves of neck. Hence the any dysfunction within the neck structures commonly leads to jaw problems and vice versa.<sup>12</sup> Anyone experiencing numbness, tingling, dizziness, nausea associated with neck pain should be evaluated by chiropractors to rule out cervical impingement of nerves and vessels in neck.

### Postural imbalance

Posture represents the spatial relationship of skeletal

structures to one another. Teeth are considered to represent the terminal endpoint of postural chain. Thus the way teeth articulates affects the relationship of TMJ within the glenoid fossa, which in turn affects the occiput and cervical spine. The mandibular postural muscles are the part of muscle chain that allows the individual to remain standing with head erect. So the stress or muscle spasm in either of these components is reflected in the corresponding regions via their interconnecting fascial sheath system.<sup>13</sup> the atlanto-occipital joint where the skull meets the neck via C1, has an integral role of jaw mechanics in the development of posture. According to the Casey Guzey's Quadrant theorem, the muscles controlled the pivotal axis of mandible occurs at the dens between atlas and axis vertebrae. As a result, mandibular misalignment and dysfunction creates a disturbing posturing of C1 & C2. These vertebrae are intimately related to spinal and head posture and neurological well being. A part of dura matter of brain is attached to foramen magnum and to the frontal dorsal aspects of C1, C2 and C3. The malposition of C1 & C2 torques the dura matter and causes scoliosis, excessive lumbar lordosis, head tilt, cervical hypolordosis, thoracic hyperkyphosis.

<sup>14,15,16,17,18</sup>

### Deviated nasal septum

DNS is a condition in which the nasal septum, the bone and the cartilage that divide the nasal cavity into half is off the center making the difficulty in breathing. In response of nasal obstruction, the tongue drops and the inward pressure of buccal mucosa are left unstopped. This effect is further enhanced by a pressure differential across the hard palate in the absence of nasal airflow leads to narrow high arched palate. Long term airway dysfunction are many including lateral tongue thrust development which causes depressed eruption of lower posterior quadrants leading to deep bite and distalisation of condyles resulting in TMJ compression.<sup>19</sup>

### Sleep & TMD

Many studies have shown a prevalence of TMD among patients with obstructive sleep apnoea {OSA} [sleep related breathing disorder] and sleep Bruxism [sleep related movement disorder].<sup>20</sup> OSA occurs when muscles around patient airway relax during sleep causing airway to collapse and block the intake of oxygen. Masticatory and tongue mus-

cle activity during sleep is thought to play an important role during sleep disordered breathing (SDB). In OSA, the influence of gravity on mandible, especially in supine position combined with masticatory and tongue muscle hypotonia results in posterior shift of mandible and tongue creating oropharyngeal narrowing and increase in upper airway resistance.<sup>22</sup> The immediate effects are oxy hemoglobin desaturation, blood pressure, heart rate fluctuations and long term effects include systemic hypertension, cardiovascular diseases, and metabolic syndrome.<sup>21</sup> In the process of inspiratory effort, activation of submental muscle occurs leading to mouth breathing.

Sleep bruxism (SB) is defined as a stereotyped movement disorder characterized by rhythmic masticatory muscle activity associated with tooth grinding and occasional tooth clenching.<sup>22</sup> The gold standard for the diagnosis of sleep bruxism is polysomnogram. The consequences of sleep bruxism are attrition, abrasion, and masticatory muscle hypertrophy, hypersensitivity of teeth to air, cold or hot food and beverages. Miyawaki reported that among SB adult patients 74% swallowing and RMMA occurs in supine position compared to 23% in lateral decubitus position suggesting sleep position may be a factor in the frequency of oromotor events.<sup>23</sup> Sustained and repeated adverse loading of masticatory system that occurs with SB can cause TMD.<sup>25,26,27,28</sup> The use of oral appliance [OA] in patients with mild to moderate OSA had shown a success rate of 60-80%. OA protrude mandible and induce changes in the anterior portion of tongue, soft palate, lateral pharyngeal walls and mandible resulting in improved airway patency.<sup>30</sup>

### Otagic symptoms

Embryologically, the TMJ and the regions except anterior process of Malleus originates from the Merckel's cartilage. Anatomically, the posterior wall of glenoid fossa is formed by the tympanic part of temporal bone. The tympanic plate separates TMJ from external auditory meatus. Physiologically, the muscles tensor tympani and tensor palatine are innervated by the trigeminal nerve which innervates the muscles of mastication.

The dysfunction of the tensor tympani muscle in conjunction with tensor veli palatini muscle also plays

an important role in the relationship of TMD and otic symptoms. TMD produces contraction and tension in the tensor veli palatini and tensor tympani muscles that can generate different abnormal muscular behaviors. In TMD the sustained contraction of tensor tympani muscle can alter the ossicular spatial position and the endolymphatic pressure through the transmitted changes from the oval window to the labyrinth walls. This can unchain and unbalance the vestibular impulses expressed in vertigo. Additionally, the same middle ear pathogenic muscle mechanism can diminish the sonic transmitting vibration from the tympanic membrane toward the oval window through the ossicular chain which is expressed as a hearing impairment.<sup>31</sup>

## CONCLUSION

Understanding the influence of occlusal proprioception on the human body requires the intimate knowledge of histology, anatomy and physiology of neuromuscular complex. Thus dental occlusion may not only related to the position of mandible and skull, but also with the cervical spine, supra and infra hyoid structures, the shoulders and thoracic and lumbar spine with function as one biochemical unit. These structures also provide orthostatic stability of skull on the cervical spine with if compromised influences on etiology of craniomandibular dysfunction and Orofacial pain. The doctors should not only be the care taker of the dentition but also the health of all structures innervated by and/ or connected to them. Hence the general examination is an important aspect in the TMD diagnosis which shouldn't be neglected as the management of TMD should be done by a multi disciplinary approach.

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