Review Article

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A REVIEW OF TEMPOROMANDIBULAR JOINT DISORDERS IN INFANTS, CHILDREN AND ADOLESCENTS

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ABSTRACT:

Associations between temporomandibular disorder (TMDs) with daily activities have been described and reported in middle aged individuals. But the same in children although not as common as in adults but nevertheless prevalent has been 'terra incognita'. There are numerous literatures on TMDs in adults and their treatment planning but very few on children and adolescents. It is now a well known fact that the TMDs can have its effect right from the age of infancy. So this article attempts to enumerate the etiology, classification, diagnosis and treatment of TMDs in infants, children and adolescents.

Keywords: Temporo-mandibular Joint, Temporo-mandibular disorder, Myalgia, TMJ imaging

INTRODUCTION

Temporo-Mandibular-Joint disorders, commonly known as TMJ disorders or TMD (Temporo-Mandibular Disorders) are a group of neuromuscular and musculoskeletal conditions which include several signs and symptoms which involve the TMJ, the muscles of mastication and associated structures.[1] Among the main signs and symptoms of TMJ disorders are muscle and TMJ pain, joint sounds, mandibular movements getting asymmetrical, reduced mouth opening, muscle sensitivity. Children and young adolescents are frequently seen to be affected with TMJ disorders and most adults who have temporomanibular disorders are often seen to report that these symptoms have developed during their adolescent times.[2] Prolonged and continuous masticatory pain if untreated can become a chronic condition and can further proceed to produce centrally mediated muscle pain (myalgia).[3] Likewise, patients who suffer from chronic TMD often find the pain to be radiating to the face and head and also to other parts of the body.[4],[5]

Etiology

According to James A Howard, there are various predisposing, precipitating, and perpetuating factors that play a major role in developing TMDs.

The various factors are

- Trauma on a Micro level: This includes activities that produce repetitive strains such as playing a wind instrument, fingernail biting or even scuba diving and swimming.
- Trauma on a Macro level: This basically includes any external

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blow to the TMJ area directly such as sports injury, physical abuse, road traffic accidents, or indirect force to the TMJ such as any blunt force to the chin. Addition trauma includes cervical traction and third molar extraction.

- Stress induced parafunction such as tooth grinding and clenching
- Night bruxism
- Deep bite, retruded maxillary inxisors
- Overjet of more that 6 mm
- Extracted of missing posterior teeth without prosthesis
- Congenital or Developmental condylar abnormalities
- Systemic diseases including Rheumatoid arthritis, spondylitis, Reiters Syndrome, systemic Lupus Arthritis
- CNS mediated palsy such as cerebral palsy, facial palsy, Parkinson disease, Tics, dyskinesia

Some other minor but unignorable factors include improper craniocervical posture while working and sitting7 and depression, anxiety and psychological distress.[3]

Examination and Diagnosis of TMD

A thorough Physical and Radiological examination is imperative for the correct diagnosis of TMDs and to differentiate it from other symtoms which may seem to be TMDs but may actually be not such. The following set of questions is mandatory to be asked to the patient[3]:

- Any difficulty or pain in mouth opening?
- Any noises within the jaw joint?
- Any pain in and/or around ears or cheeks?
- Any pain while talking or chewing?
- Has the bite ever felt unusual or uncomfortable?
- Any previous history of injury or trauma of the jaw, neck or head?
- Any history of TMJ treatment? If yes, when, where and how?
- Following should be included in the Physical Examination

Palpation: Cervical muscles and Muscles of Mastication should be palpated for any signs of pain, tenderness or referral pains. Manual pressure bilaterally on Temporalis and Masseter muscles while the patient clenches causes pain or tenderness is indicative of atrophy or hypertrophy which can be due to extreme levels of bruxism.

Range of Motion: The ability to place 3 fingers vertically in a handshake position means a normal range of madibular opening of 35-50 mm.[8] The patients inability to get even 2 fingers vertically between the incisal edges is a matter of concern and should be investigated for the underlying cause. Likewise, the normal side to side movement(excursive mandibular movement) is around 8 to 10 mm. This can be calculated by observing if the patient can move the mandibular jaw sideways by the width of the maxillary central incisor (as the

mesiodistal width of the upper central incisor is 8-9mm).

Palpation of TMJ: The patient is asked to open the mouth halfway while the clinician presses the finger in the depression created behind each condyle in front of the tragus of the ear. Any discomfort felt during opening and closing of the mouth implies TMD. This process also aids the clinician to feel any kind of irregular movements or asynchrony or clicking sounds.

Load testing: The clinician applies force under the angle of the mandible when the occlusion is slightly out of contact. The contra lateral capsule is tested the patient chews on a wax block or cotton roll in between the molars. This is because the squeezing action torques the TMJ of the contra-lateral side and thus the clicking can be triggered subsequently eliciting the joint or the muscle pain experienced by the patient while chewing. If the pain is due to inflammation, biting on tongue blade on the side of the joint may help alleviate the pain or discomfort.

Auscultation of TMJ sounds: This is performed by placing a stethoscope over the joint. This is helpful in distinguishing the intensity and character of the sound. There are three distinct types of TMJ sounds. Clicking(snapping and popping), Soft tissue crepitus and Hard tissue grating. The auscultation should be done during, opening, closing and side to side jaw movements. The primary cause of TMJ sounds is internal derangement of disc or disc displacement. But the other causes can include intracapsular adhesion, altered synovial lubrication, deviation in the shape of the articular disc.

TMJ IMAGING

TMJ imaging is done to get a clearer picture of the temporomandibular joint disorder. This is done in patients who have not responded positively to conservative TMD treatments.[9] They include

- Full mouth periapical films
- Panaromic Radiographs
- Lateral Cephalogram
- TMJ tomography
- Magnetic Resonance Imaging (in both open mouth and closed mouth for better viewing of disc position)
- CBCT (Cone Beam Computerized Tomography)
- TMJ Arthrography

The feasible panaromic radiograph is an helpful aid to assess and evaluate condylar head anatomical morphology and angulation. But the biggest drawback is that the joint space, condylar motion and the soft tissues cannot be evaluated. CBCT can be used to detect abnormalities in the bone as in the case of fractures and also aids in assessing asymmetry but the drawback with this technique is that it generates much higher radiation energy that the conventional panaromic radiograph.[10] To visualize the soft tissue, be it the contours and position of the disc of the TMJ, and to detect inflammation, the MRI is a very useful aid.[11] TMJ

arthrography is an invasive procedure so it is generally not advocated in routine diagnostic procedure.[12] In case of children and adolescents, age related changes of the condyle have to be considered. As the condylar size increases with advancement of age, there is decrease in the angle and thus the position of the condyle in the fossa changes. The shape of the condyle changes from round to an oval configuration.[13]

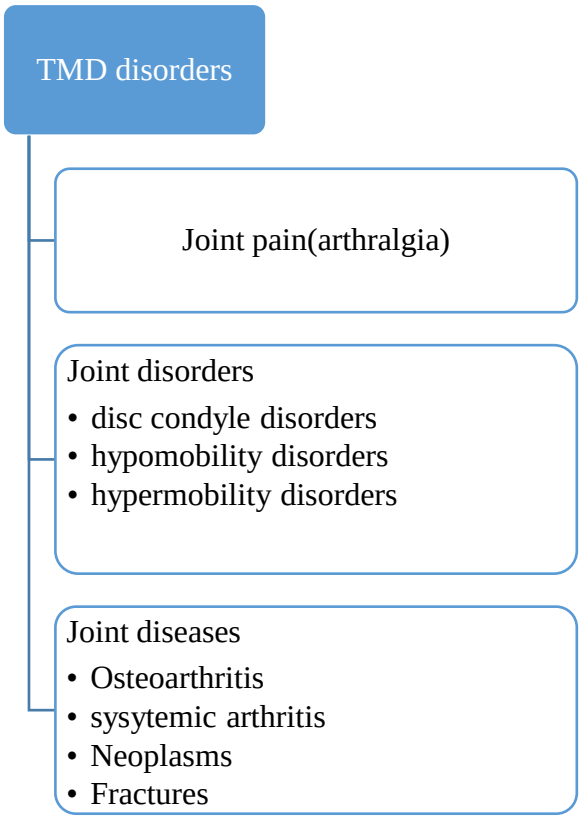
Classification of TMDs

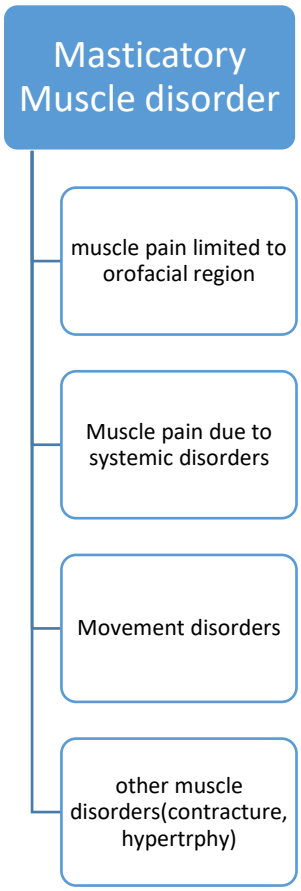
These are broadly classified into two types. TMD disorders and Masticatory Muscle Disorders.[14]

Orofacial pain, restricted jay function and jaw joint noises are the three cardinal signs of TMDs.

Treatment of TMDs in children and adolescents

Treatment modalities are categorized into two types: Reversible and Irreversible treatment





Reversible treatment includes

- Patient education: It includes relaxation training, patient awareness about clenching and bruxism. For eg: in the case of nail biting habit, the TMJ is loaded with heavier force when biting with incisors as compared to normal biting force with the molars.[15]
- Physical therapy: Jaw exercise, TENS (Transcutaneous Electrical Nerve Stimulation), coolant therapy, thermotherapy
- Medications: NSAIDS (Non Steroidal Anti Inflammatory Drugs) and Muscle Relaxants have provent to be effective in reducing pain in TMDs.[16]
- Occlusal splints: They help by temporarily altering the patient's occlusion and decrease parafunctional activity.[17]

Irreversible Treatment includes

- Occlusal Adjustments: By selective grinding the teeth or else full mouth rehabilitation
- Orthodontics: Although headgears and functional appliances can be used to permanently reposition the mandible, there is little evidence that this method can relieve TMDs.[17]
- Botulinum injections: Recently approved to be used in adults but not yet for children. [9]

DISCUSSION:

Wright EF et al conducted a survey and found that parafunctional habits and postural imbalance in adults were a major cause for TMDs.[18] TMDs have a direct correlation with age and gender of the patient. A study doen by Kohler et al in 2012 demonstrates the incidence of TMDs declines as age advances and most TMD symptoms are seen in patients among 20- 40 yr olds.[19] Studies have shown that TMDs are more common in girls than in boys.[20] This may be attributed to the fact that females have a lower pain threshold and are more vulnerable to stress.[21] Apparently, patients suffering from myofacial TMDs have reported symptoms of anxiety and depression as compared normal pain free individuals.[22] Adolescents with TMD are more likely to experience multiple bodily pains as compared to healthy patients.[23] Several studies done have established a coorelation TMDs and oral parfunctional habits in children and adolescents.[24] Self awareness among TMDs in children and adolescents is very important but at the same time it is also important that the patiens suffering from TMDs don't create a barrier between themselves and the society. Karebe H et al conducted a study on prevalence and association of self-reported anxiety, pain, and oral parafunctional habits with temporomandibular disorders in Japanese children and adolescents and although they concluded that TMD symptoms were associated with other orofacial pain conditions, particularly

neck pain, the major drawback of the study was that there was very less self awareness of TMDs among the major population and they relied on participant recalling and reporting.[25]

CONCLUSION:

The American Academy of Pediatric Dentistry recommends that every comprehensive dental history and examination should include a TMJ history and assessment, including questions about mandibular dysfunction and previous orofacial trauma. In time diagnosis can positively affect the treatment plan and the prognosis. But at the same time it should be the clinician who should have a thorough knowledge of the anatomy of the TMJ and TMDs so as to assess whether to wait and observe or to treat or to refer.

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