Research Article

The Otological manifestation of temporomandibular disorders

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Abstract

Aims: To detect the frequency of TMD, analyzing its symptoms, and to determine its otological manifestations as otalgia, tinnitus, ear fullness, and hearing impairment.

Patients and Methods: During 4 months period, 350 patients visiting ENT department for their ear complaints, only 72 patients were selected and submitted to this study by filling the questionnaire regarding their symptoms of TMD and their otological complaints, followed by full ENT examination (there is normal otoscopic finding) and clinical examination of the temporomandibular joint (TMJ) and adjacent area.

Results: Among 350 patients, 72 patients had TMD (20.5%), 44 male (61.1%) and 28 female (38.9%). Regarding the most common TMD symptom TMJ pain (48.6%) was commonest, followed by joint clicking sounds (23.6%), pain on masticatory muscles (18.1%), and limitation of jaw movement with or without jaw deviation (9.7%), while the most common ear symptom was otalgia (52.7%),followed by ear fullness (23.6%), tinnitus (22.2%), and hearing impairment (1.3%).

Conclusions: High frequency rate of TMD, the most common TMD symptom was TMJ pain and the most common ear symptom was otalgia.

Keywords: TMD, Otological manifestation, TMJ

INTRODUCTION

Temporomandibular disorder (TMD) are constellation of pathological and functional conditions affecting the temporomandibular joint (TMJ) and muscles of mastication as well as contiguous tissue components.[1] Common signs and symptoms of TMD are, clicking or crepitating noises in TMJ, limited jaw opening capacity, deviation in the movement pattern of the mandible and masticatory muscles and/or TMJ pain.[2] Regarding otological symptoms related to TMD, the most cited in the literatures were tinnitus, otalgia, ear fullness, hearing loss and vertigo.[3, 4] The association of TMD and the origin of otogic symptoms, yet not fully understood, but there were some hypothesis about the relation between otological symptoms and TMD.[5] The first study was by Costen who suggested the lack of posterior dental support and the consequent alteration to the mandible condyle positioning could result in set of symptoms among which some are ontological.[6] Pinto found several structures of TMJ region were connected to the malleus via petrotympanic fissure, this result in excursion of the disc and condyle during mandibular movement which could induce mobility of the malleus and alter the tension of the tympanic membrane.[7] While Myrhang believed that neuromuscular dysfunction might trigger alteration in sound conducting apparatus so these might be responsible for aural symptoms.[8] Ash suggest that reflex hypertonic of tensor tympani and tensor veli palatine muscles result in ineffective opening of Eustachian tube and poor ventilation of middle ear cavity.[9] In relation to

tinnitus, it is not clearly understood yet, if TMD contribute to its development or they are the same phenomenon, although some researchers found solid relationship between facial masticatory muscle movements and the variation in the intensity of tinnitus.[10] Also Ziefel et al affirm that the most common mechanical cause of objective tinnitus is palatal myoclonus and middle ear myoclonus with rhythmic movement of the tympanic membrane, but the objective tinnitus is less frequent than subjective tinnitus.[11] It is important that focus should be alert to the symptoms of tinnitus, such change maybe due to diseases of the inner ear or central nervous system and not only for TMD.[12] Since then the origin of otological symptoms in TMD patients based on anatomical-functional consideration between TMJ, muscles innervated by trigeminal nerve and ear structure.[13]

Aims: The purpose of this study was to detect the frequency of TMD and analyzing its clinical features as well as to evaluate it's the otological manifestation such as otalgia, tinnitus, ear fullness, and hearing impairment.

Study setting: This study was conducted in AL Yemen where there is jaw habit which is chewing "QAT" which (based upon retaining big amount of it inside the cheek, up to several hours per day for many years).

PATIENTS AND METHODS

Among 350 adult patients who attended the ENT department from 1st of January to the 1st of May 2005 seeking medical advice for their ear complaints (specific population), only 72 patients were selected to this study because of having TMD, the clinical diagnosis of the TMD done depending upon the presence of Greene cardinal features which are (pain on TMJ, joint crepitus or clicking sounds, limitation in the mandibular movement, and tenderness on the masticatory muscles.[14] Also we looked for jaw deviation during mouth opening and jaw habit (QAT chewing), and data collection carried out by the means of self-taken questionnaire, while exclusion criteria included any local ear pathology such Otitis externa, Acute or Chronic otitis media , previous ear surgery and any referred otalgia other than from TMJ, then full ENT examination particularly otoscopy including (siegle pneumatic speculum) where there is normal otoscopic finding, Tuning fork tests, while audiometry and tympanometry when needed and Dental consultation if necessary. Although the ear symptoms and the TMD features usually present in combination and in varying degree of severity, but we selected the most severely frequent (chief complaint) symptom according to patient himself. So for TMD features which include (TMJ pain, joint clicking or crepitus, pain on mastictory muscles, and limitation of jaw movement with or without jaw deviation), and for otological manifestation which include (otalgia, tinnitus, ear fullness, and hearing impairment), while vertigo did not included in this study, although it sometime associated with TMD because it require otoneurological examination of vestibular pathology which is not done in this study.

RESULTS

There were 72 patients of 350 having TMD, so the frequency rate is (20.5%), table1 shows the number and percent of TMD patients with Gender and affected side.

Table1. Gender and side of TMD

Gender	Number and percentage of TMD patients	Right side	Left side	Both sides
Male	44 (61.1 %)	25 (56.8 %)	19 (43.2%)	0 (0%)
Female	28 (38.9 %)	16 (57.1 %)	12 (42.9%)	0 (0%)
Total	72	41 (56.9 %)	31 (43.1%)	0 (0%)

Regarding the symptoms of TMD, table2 shows the number of patients and percent of their TMD symptoms between sample distributions.

Table 2. TMD symptoms

TMD Patients	TMJ pain	Joint Clicks	masticatory muscles pain	Limitation of jaw Movement *(+/-) deviation
72	35	17	13	7
100 %	48.6%	23.6%	18 %	9.7 %

*(+/-) = with or without

The results of the otological manifestation among TMD patients' distributions, table3 shows the number of patients and their Otic symptoms percent.

Table3: Otic symptoms in TMD patients

TMD patients	Otalgia	Ear fullness	Tinnitus	Hearing impairment
72	38	17	16	1
100 %	52.7 %	23.6 %	22.2 %	1.3 %

DISCUSSION

The frequency of TMD signs and symptoms in general population ranged between 5% and 50%, also many epidemiological studies evaluated the prevalence of TMD in different population, such as Caucasian (17%-20%), Hongkong Chinese (21%), Native American (23%-26%).[15] The prevalence TMD in the present study was (20.5%), although this study is performed on "specific population" and in only 4 months period, but its incidence looks to be high , this is probably related to the presence of widely spread of jaw habit which is "QAT" chewing, leading to harmful effect on the TMJ in this community. Regarding gender distribution many studies shows female predominance.[12] But the results of present study show male predominance; this probably due to "community culture" as well as jaw" QAT" habit is more prevalence in men. In this study all TMD are thought to be personal issue. Regarding the most common symptom among TMD in this study, TMJ pain was (48.6%), joint clicking sounds (23.6%), masticatory muscles pain (18%), and jaw limitation and/or deviation (9.7%). While on review of 18 epidemiological studies reports that TMJ sounds was (19%), mandible stiffening and tiredness (11%), limitation of mandibular movement (8%), and pain on mandibular function (6%).[16] In this study, TMJ pain is the most common symptom, this result is compatible with that of Seppo Kuttil results showed that pain on TMJ and muscles during mastication was (55.6%), jaw clicking (55.6%), while opening mouth difficulty (11.1%).[17] Also Mari results showed that TMJ pain was (60%), pain on master muscle(60%), jaw clicking(70%), and deviation of jaw movement(60%).[16] While Ordubazari results showed that are TMJ pain was (35.4%), joint sounds (37.6%), muscle sensitivity (46.3%), and limitation of jaw movement(80.5%).[18] Also Otuyemi et al results showed that are TMJ pain was (2.6%-2.9%), TMJ sounds/deviation (8.1%), masticatory muscle pain(3.2%), but impaired range of mandibular movement was (58.1%).[19] This difference in the results may be related to different material studied. When considering the otological manifestation of TMD, the results are as follows: otalgia (52.7%), ear fullness (23.6%), tinnitus (22.2%), and hearing impairment (1.3%). On review of 18 epidemiological studies reports, the most common ear symptoms in TMD patients are otalgia(7.5%), tinnitus (17.5%), ear fullness (17.5%), and hearing impairment (hypoacusis) (15%).[16] According to results of this study, the most common ear symptom is otalgia, this agree with results of Costen showed that otalgia was (38%), tinnitus (13%), hearing loss (13%), ear fullness (6%).[6] Also koskinen et al results showed that otalgia was (47%), tinnitus (20%), hearing loss (24%), and ear fullness (26%).[20] Also Tuz et al results showed that otalgia was (57.2%), tinnitus (48.3%), and hearing loss (29.4%).[3] As well as Ahmad AL-Tuhafi results showed that otalgia was (36%), tinnitus (27%), and hearing loss (4%).[21] While Cooper et al reports that otalgia and tinnitus both are (63%), ear fullness (30%), and hearing loss (25%).[22] While Maria reports that tinnitus was the most common ear symptom (70%).[23] And in Ordubazari study, the hearing loss (89%) was the most common ear symptom,[18] while in Kent Cox study, reports that tinnitus and ear fullness (58%) were the most common ear symptoms.[24] The differences between the results are probably related to different sample collection.

Conclusions

The results of this study conclude that there was a high frequency rate of TMD patients. Regarding the most common TMD symptom was TMJ pain, and the most common ear symptom was otalgia.

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