

Assessment of tinnitus in patients with internal derangement of TMJ

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ABSTRACT:

Background: Tinnitus has been shown to be strongly associated with anxiety and depression. The present study was conducted to assess tinnitus in patients with internal derangement of TMJ.

Materials & Methods:170 patients with complaint of tinnitus referred for arthrographic examination of the TMJ were enrolled in the study. Disk positions were diagnosed as normal superior position, anterior disk displacement with reduction or anterior disk displacement without reduction. Symptoms such as tinnitus and blockage sensation in the ear was recorded. Tinnitus was recorded as absent or present

Results: Out of 170 patients, males were 100 and females were 70. Tinnitus was present in 130 and absent in 40. Location of pain was TMJ in 80, lower lateral face in 20, bac of eye in 10 and temporal region in 20 cases. Other findings were painful chewing in 35, stressful life in 42, limited mouth opening in 78 and bruxism in 40 cases. The difference was significant ($P < 0.05$).

Conclusion: There was high rate of tinnitus in patients with internal disc derangement of TMJ.

Key words: tinnitus, internal disc derangement, TMJ

Introduction

Subjective tinnitus, ringing in the ears, is a prevalent phantom sound perception (prevalence ranging from 5 to 43%) that in many cases can be severe to the point of seeking medical care. Existing treatments are unsatisfactory and are of limited efficacy. Tinnitus, defined as clinically significant tinnitus, or according to the Tinnitus Handicap Inventory (THI), has been shown to be strongly associated with anxiety and depression.¹ Studies have also shown an important contribution of stress as a psychiatric co-morbidity with an overall damaging impact on life quality and subsequent healthcare costs. Sexual dimorphism on the psychological impact of tinnitus has also been revealed, whereby tinnitus is associated with an increased risk in suicide attempts only in women.²

In previous epidemiological and clinical studies which focused on the relationship between tinnitus and craniomandibular dysfunction, the diagnosis of joint pathology has not been specified.³ Instead, the cumulative terms craniomandibular disorders (CMD) or temporomandibular disorders (TMD) have been used. Both tinnitus and TMD of myogenous origin can be related to stress. Thus, it is possible that some patients with myogenous TMD coincidentally complain of tinnitus. No causal association between tinnitus and TMD could be found in these patients.⁴

TMD of arthrogenous origin, such as TMJ internal derangement, differ from the myogenous TMD in pathogenesis and, therefore, should be addressed separately. The TMJ and auditory organs are both anatomically and phylogenetically related to each other. Direct connection between joint structures and the middle ear has been.⁵ The present study was conducted to assess tinnitus in patients with internal derangement of TMJ.

Materials & Methods

The present study comprised of 170 patients with complaint of tinnitus referred for arthrographic examination of the TMJ of both genders. All were enrolled in the study after they agreed to participate in the study.

Demographic data such as name, age, gender etc. was recorded. Disk positions were diagnosed as normal superior position, anterior disk displacement with reduction or anterior disk displacement without reduction. Symptoms such as tinnitus and blockage sensation in the ear was recorded. The clinical examination was carried out. Tinnitus was recorded as absent or present. Results thus obtained were clubbed for statistical analysis. P value less than 0.05 was considered significant ($P < 0.05$).

Results

Table I Distribution of patients

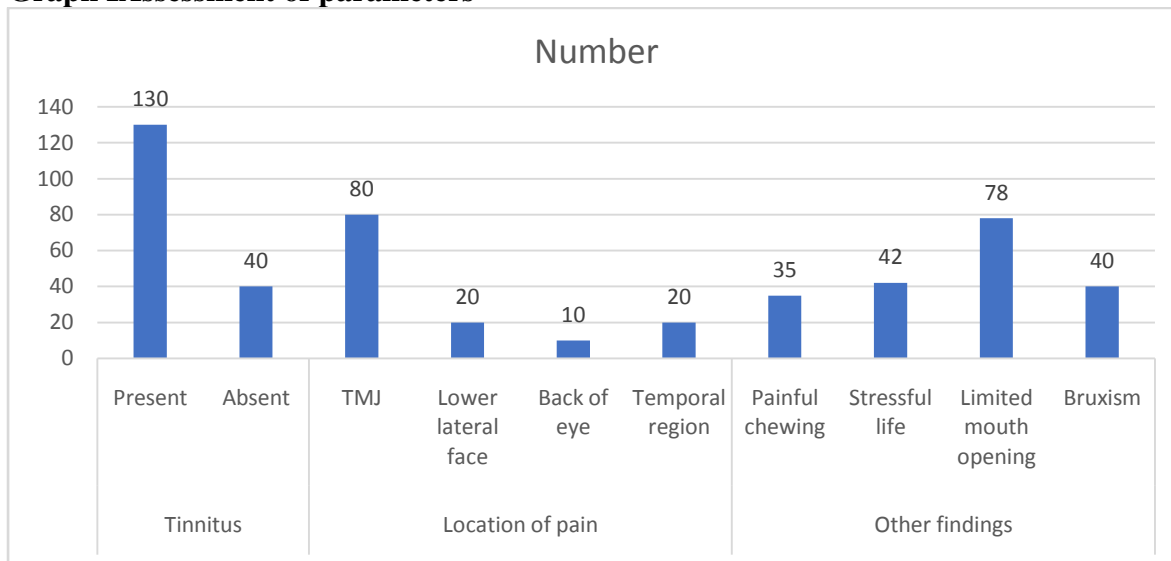
Total- 170		
Gender	Males	Females
Number	100	70

Table I shows that out of 170 patients, males were 100 and females were 70.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Tinnitus	Present	130	0.01
	Absent	40	
Location of pain	TMJ	80	0.01
	Lower lateral face	20	
	Back of eye	10	
	Temporal region	20	
Other findings	Painful chewing	35	0.05
	Stressful life	42	
	Limited mouth opening	78	
	Bruxism	40	

Table II, graph I shows that tinnitus was present in 130 and absent in 40. Location of pain was TMJ in 80, lower lateral face in 20, bac of eye in 10 and temporal region in 20 cases. Other findings were painful chewing in 35, stressful life in 42, limited mouth opening in 78 and bruxism in 40 cases. The difference was significant ($P < 0.05$).

Graph I Assessment of parameters**Discussion**

The mechanisms by which tinnitus occurs are still poorly understood.⁶ The current pathophysiological models stipulate that tinnitus emerges as a failure to adapt to missing sensory information originating from the ear.⁷ This results in a compensatory mechanism in the brain translating into a greater neuronal activity (central gain) along the auditory pathway.⁸ Limbic structures (e.g., amygdala), that are involved in emotional processing, have been shown to be connected to the auditory pathway and it has been proposed that these contribute to tinnitus.⁹ Interestingly, there is a striking resemblance between the pathways that are involved in tinnitus and chronic pain, converging toward frontostriatal circuits including the ventromedial prefrontal cortex (vmPFC) and the nucleus accumbens (NAc).¹⁰ The present study was conducted to assess tinnitus in patients with internal derangement of TMJ.

We found that out of 170 patients, males were 100 and females were 70. Renet al¹¹ determined if there was any correlation between arthrographically verified disk displacement of the TMJ and ear symptoms related to tinnitus. Fifty-three patients with unilateral tinnitus and disk displacement and 82 individuals with disk displacement, but no tinnitus, were analyzed. Disk displacement was found to be present in the ipsilateral joint in all 53 patients with unilateral tinnitus, while the contralateral joint was asymptomatic in 50 (94.3%) of them. Patients with tinnitus suffered more extensive and intense pain in the oro-facial area compared to patients without tinnitus. The results of this study revealed a significant correlation between internal derangement of the TMJ and tinnitus.

We observed that tinnitus was present in 130 and absent in 40. Location of pain was TMJ in 80, lower lateral face in 20, bac of eye in 10 and temporal region in 20 cases. Other findings were painful chewing in 35, stressful life in 42, limited mouth opening in 78 and bruxism in 40 cases. Edvallet al¹² investigated the socio-economic factors, phenotypic characteristics and psychological variables of tinnitus subjects from the Swedish Tinnitus Outreach Project, with ($n = 486$) or without ($n = 1,996$) TMJ complaints. The prevalence of TMJ complaints was greater in tinnitus subjects with severe tinnitus (36%) when compared to those with any tinnitus (19%), strongly indicating the contribution of TMJ problems to the severity of tinnitus. Comparing subgroups with or without TMJ complaints in the whole sample, differences were found regarding a large number of socioeconomic, phenotypic, and psychological characteristics. Subjects with TMJ complaints were more often women, more often reported stress as the cause of tinnitus, were more severely affected by tinnitus, scored

worse in measures of psychological well-being and life quality, and were more often affected by problems tolerating sounds, headache, vertigo/dizziness, and neck pain. In addition, they more often reported pulsating and tonal tinnitus, somatic modulation of tinnitus, and aggravation of tinnitus by loud sounds and stress. When focusing the analysis in subjects with tinnitus as a big problem using the Tinnitus Functional Index cut-off ≥ 48 , or with severe tinnitus according to the Tinnitus Handicap Inventory cut-off ≥ 58 , the impact of somatosensory modulations and stress on tinnitus were greater in subjects with TMJ complaints in comparison to those without.

It is now agreed that tinnitus is a heterogeneous condition that cannot be considered a single entity. This may explain why existing interventions are not successful for all patients, and thus identifying “subtypes” is needed to tailor treatments according to a patient profile and improve therapeutic outcome. Common factors related to tinnitus include hearing impairment, head/neck injury, ear infections, depression, and non-steroidal anti-inflammatory drugs (NSAIDs).¹³

Conclusion

Authors found that there was high rate of tinnitus in patients with internal disc derangement of TMJ.

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