Reviewer's report

Title: Temporomandibular joint disorders severity correlates with the degree of mouth opening and hearing loss.

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Reviewer: James Fricton

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Summary.
This paper presents the results of a cohort study of temporomandibular disorders and its relationship with hearing symptoms. The study involved 464 healthy Greek university students (156 men and 308 women) with a mean age of 19.6 years. In addition to demographics, TMJ symptoms, and mouth opening, hearing symptoms and an audiogram were recorded for each subject. The overall incidence of TMD symptoms was very high at 73.3% and were compared between those with TMD and those without. The number of aural symptoms was associated to the TMD severity and maximum mouth opening. Audiometry also showed that moderate and severe TMD was associated with hearing loss of median and low tones respectively. TMJ pain, TMJ ankylosis, and bruxism were also found to be statistically different between TMD and non-TMD subjects.

The strengths of this paper are many include;
1. This paper is scientifically and methodologically accurate and presents results that will have broad appeal to the readership of the Journal.
2. There is a need for this type of epidemiological surveys of temporomandibular disorders (TMD) in a general population that focus on aural symptoms and these findings are interesting and important.
3. The strong methodology in examining subjects with audiology
4. The large sample size of 464 subjects.
5. The relevance of the results regarding the prevalence of TMD and aural signs and symptoms in this population.
6. The data consistent to that reported from similar studies.
7. As expected, gender and age differences were also found for jaw pain and limitation in jaw movements but an interesting finding and discussion is the comparison of different ethnicities. However, authors need to be careful in describing causes for differences in findings between different ethnic groups.

The weaknesses of this paper are also many. The revisions include;

- Major Compulsory Revisions

1. Although the results are relevant and interesting, the major weakness paper is that it is written without clarity and focus. The authors need to rewrite the
background and discussion sections to focus more on aural signs and symptoms since that is the most relevant part of this study. For example, comments such as:

a. “TMD is thought to be caused by occlusal, traumatic, mobility, stress, hereditary and systematic factors, as well as personality, age and gender [3].“ and 

b. “Free radicals play a role in joint erosion while sex hormones affect the extracellular matrix in TMD [4].”

c. seem to be out of context and not related to the paper.

2. There is no description of the sampling methods. How are the students recruited and what incentives were used? What percent of those who were contacted, agreed to participate?

3. This statement is incorrect. “The maximum mouth opening distance .... can be used to discriminate between subjects with and without TMD [5].” The use of use of validated diagnostic criteria can only do this with some validity. The RDC for TMD (Schiffman et al, J Orofacial Pain, 2009) needs to be used to determine diagnostic accuracy. Since all of this data was not collected, some adaptation of these diagnostic criteria should be used to divide into TMD and non-TMD groups.

4. The description of the TMD examination technique should be consistent with the methods described in the RDC for TMD.

5. As noted earlier, the discussion should focus on aural symptoms and should drop all discussions related to TMJ signs and symptoms and their etiology. However, the discussion on ethnicity is interesting and relevant.

6. There is a tendency to include broad sweeping statements in the discussion instead of precise comments. For example, the statement in referring to reasons for limited mouth opening, the authors state that “ This may be the result of protective muscle contraction around the temporomandibular joint, the parafunctional activity of the masseters, chronic trauma or inflammation” . It would better to simply compare the finding with the literature instead of proposing etiology.

- Minor Essential Revisions

1. How was “bruxism, temporomandibular joint ankylosis and history of joint pain” defined and over what time period? Ankylosis is a diagnosis but they only asked subjects to self report it.

2. Likewise, how was a “feeling of fullness or pressure in ear, brief vertigo (less than 5 minutes), cold and warm air sensitivity, itching of the acoustic canal, and a history of diagnosed hearing loss, more than four events of otitis, tinnitus or ear pain” defined to the subject and over what time period.

3. In the results, they need to present all findings with regard to both the n and the %.

4. In the Discussion, several statements need to be clarified. For example, “The reasons for these differences remain unclear, although they may reflect ethnic
differences between the populations studied " is unclear. This statement needs explanation or leave it out.

**Level of interest:** An article of importance in its field

**Quality of written English:** Not suitable for publication unless extensively edited

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests