Author's response to reviews

Title: The Acute Effects of Alcohol on Auditory Thresholds

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Response to reviewers' comments:
We note with interest the choice of reviewers and appreciate their comments. Each point is addressed. Some of the comments of the reviewers suggest unfamiliarity with the subject and standard audiological testing but we acknowledge this may also reflect cultural differences in patient populations (including alcohol drinking) and management.

Reviewer: Attias Joseph

General:
After consideration of the comments and PubMed search:
In the first paragraph:
We find no other paper directly addressing the relationship and auditory thresholds. Alcohol consumption is nationally on the increase and we would argue that this study would be of considerable interest. It is also one of the largest studies carried out in this field to date! Of course it would also be of public interest if alcohol consumption would be found to affect hearing.
We are concerned that this reviewer uses the word "him" when referring to the study, are there issues regarding understanding of written English.

Point review comments:
1. We did consider this title but found it too long with little conveyed extra meaning since auditory thresholds are usually measured in pure tones anyway.

2. The hearing was measured by a qualified audiologist in a sound proof room according to standard British Association of Audiological Physicians guidelines. We did not feel it necessary to detail this since this is done in every ENT department in the UK and the guidelines are available on the website http://www.baap.org.uk/. This is why we used these guidelines since most qualified ENT doctors would be familiar with them.

3. The patients acted as their own internal controls, a point that is obvious in the methodology. Furthermore, a detailed knowledge of the BAAP guidelines and standard audiological testing would also reveal that the audiological tests are actually based on control subjects (Normative group) in the first place!

4. After statistical advice the most appropriate test was selected. We were surprised that the reviewer although requesting a t-test or ANOVA (although he doesn't mention whether this is to be one or two way ANOVA) was unaware that the Wilcoxon signed rank test is in fact a non parametric t-test of paired values without the assumption that the data comes from a Gaussian distribution. However, as the other reviewer points out that this is a straightforward paper requiring no further statistical analysis.

5. The study in its conclusions suggests speech thresholds may be the next step however this was not the aim of the paper nor its title nor did we have ethical approval at that time to do this. Please see our other
published work (ref 7) which addresses this issue.

6. The discussion is based on our results in the light of other literature. We have limited ourselves to this only.

7. Although a full alcohol and drinking history was taken we felt that it did not change the essence of the paper and may mislead the reader. This is a topic more appropriately answered by population based studies. We do mention the chronic drinker who was in our sample, however his auditory results are not outlying and we felt to exclude him would actually bias our sample.

8. The auditory testing was done in a standard way, as the reviewer may know this is in fact a psychoacoustic test which also examines internal consistency of the respondent which is especially accurate when done by an experienced and fully qualified audiologist as in this case. The study was not looking at multiple sessions only the acute effects of alcohol and so this is not addressed but would be of interest in later studies.

9. The reviewer is misleading in his statement since measuring alcohol levels without blood testing is standard practice in the UK and not inaccurate or misleading! Breath alcohol was taken because it is the same measure used by the UK Police and has been successfully upheld in court (it is also a measure that many experienced doctors would be familiar with). In fact our Alco-meter was loaned to us by the local police and had been calibrated and serviced as per manufacturer's instructions. Many publications exist regarding the validity of the use of breath alcohol levels.

10. The reviewers comments here are confusing since we already have stated clearly in the methods section that timed psychometric and visuo-spatial tests were done before each hearing tests to control for the effects of alcohol on decision making or psychomotor ability.

11. It was not the aim of this paper to provide public health advice, obviously, the risk and benefits of alcohol consumption vary between individuals and health states, e.g. pregnant women are advised that there is no safe amount of alcohol whilst middle aged low cardiovascular disease risk patients are advised that they may take 1-2 units a day.

Response to reviewer's comments:

Reviewer: Tien-Chen Liu

General: After consideration of the comments and PubMed search:
1. We agree with the reviewer and the title will be changed to reflect the acute rather than the chronic changes in alcohol. We refer to chronic alcohol use in the discussion because we discuss in reference to only published work in the area was on in chronic drinkers and that hearing was not the main outcome measure
2. Figure one reflects the standard audiogram layout in UK practice. It may be that in the reviewer's own country the layout is different, but this type of layout is as per British Association of Audiological Physicians guidelines. 6 frequencies were used because they more accurately affected the global impact upon auditory thresholds than looking at just three or less frequencies. These are also the frequencies routinely tested in UK clinical practice.
3. The subgroup analysis is just that and for interest only. With the limited numbers we were cautious about drawing any firm conclusions. However, it must be noted that the only published work in the area was on in chronic drinkers and that hearing was not the main outcome measure. The results from the chronic drinker were not markedly different from the results found for non/infrequent drinkers. We felt that to leave them out would be to bias our population.
4. The pre-set amount of alcohol was that amount of alcohol needed to be administered to allow the subject to have a breath alcohol over the legal limit in the UK. This was obviously variable depending on the patient so no absolute figures could be given. We have made a change in the text to clarify this.
5. We acknowledge that this is the first and largest study of its kind, but statistically the numbers are small and to legitimise a subgroup by statistical analysis would be somewhat misleading. Other studies should be designed to address this. Figure 1 was altered to improve understanding and exhibit a trend of change in auditory thresholds post alcohol ingestion.

Minor
1. We have changed this statement to reflect UK experience since it may be a cultural norm.
2. We have made these changes of db to DB.
3. This is a typographical error and has been corrected.
4. This is a typographical error and has been corrected.
Discretionary
This is one of the largest interventional human studies looking at the direct effects of alcohol and a novel study looking at its association with auditory thresholds. I am ethically bound to acknowledge my co-authors who contributed to the intellectual development of the paper that the reviewer commented upon.