Reply

Dear Editor,

I would like to thank the learned reader for interest shown in the article and for the comments.

Figures 1 and 2 were made to highlight the differences in the thresholds of each retinal point by the two methods of field testing. The differences which are made obvious due to Figures 1 and 2 are due to the reasons given in discussion.

The entire study was done on glaucoma suspects and healthy participants and no patient of glaucoma was included in the study. The word suspect may have been inadvertently missed in one sentence of paragraph 4 of Discussion section.

Statistical analysis was done after determining the mean values of Mean Deviation for both FDT and SAP and the variability has been shown in Table 3.

As is well known, the stimulus size of FDT is larger than the stimulus size of SAP and it is very possible that this may be responsible for some of the differences between the two, as has been stated in paragraph 6 of Discussion section.

The study was carried out to determine if the two methods of field testing showed differences between glaucoma suspects and healthy participants as these two devices can be used to determine fields of any type of patient: glaucomatous, healthy participants, ocular hypertension or glaucoma suspects and also patients with neurologic defects.

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Letter to Editor

Dear Editor,

We have read with extreme interest the original article, “The use of Otoacoustic emission to detect subclinical inner ear damage in divers of the Indian Navy” by Raghavan et al published in Med J Armed Forces India 2014; 70:344–348.¹ The authors have done pertinent work on a topic which has hardly been investigated considering the safety and protection of the naval divers who put their lives on the line.

The inner ear insults during diving, as explained rightly in the study is multifactorial. However it becomes important to identify the preventable and avoidable factors so that appropriate measures can be instituted to enhance diving safety to the ear.

The insults are cumulative with an amount of damage that is borne by the inner ear with each deep diving. Most of the studies indicate the principle frequency that took the brunt of injury were 4 kHz, 6 kHz and 8 kHz.^{2,3} These are also the favorite frequency affected due to NIHL as rightly indicated in the study by Goplen et al.⁴ Thus it is natural to assume under water sound may be the more important factor that ravages the inner ear than the barotraumas. Smith et al in their study rightly indicate that research is wanting in the area of

behavior of human ear to under water sounds.⁵ His study emphasizes deliberation in the aspect of under water sound sensitivity, dynamic range, changes in resonance of the ear when helium–oxygen is used and non-audiological effects in order to institute protective measures.

Interestingly as noted by Hausmann et al that the risk of under water sounds including that of sonar are associated more with commercial and military divers who work on high power under water drills, hammer etc than recreational or sports divers.^{6,7} A very important aspect of evaluation of deep diving associated cochlear damage is the duration after the last dive (DALD) as pointed out in the study by Hizel et al.⁸ He noticed that the cochlea has an amazing capacity to recover from the vagaries over a few months. Thus it becomes pertinent to intervene auditory evaluation as close to the last dive to ascertain the true deterioration of hearing threshold.

It is indeed noteworthy that the authors of this article has taken research to the safety and protection of the very fabric of the Armed forces that is sailors and soldiers who do not deter from tasks entrusted to them in spite of the risks associated. MJAFI will definitely achieve its role and purpose with more of such articles.

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Reply

Dear Editor,

I would like to thank the readers for the interest shown in our article. We are grateful for the comments. As a whole, we by and large agree with, and appreciate the comments in the above letter regarding our article. As brought out in the article and in the above Letter to the Editor, the damage to the Inner Ear is probably multi-factorial and cumulative.

It is because of the likely cumulative nature of the damage to the Inner Ear that we studied the possible incidence of increased Inner Ear Damage with rise in Diving Years. However our study did not find a correlation between the length of the Diving Career and incidence of Inner Ear Damage as measured by OAE. This does not however exclude the possibility; a much larger study may shed further light on this subject.

Noise as a cause of Inner Ear Damage has been mentioned in the article and in the Letter to the Editor. However with the present facilities and equipment available, it may not be possible to conclusively prove what proportion of the Inner Ear Damage is due to Noise. However it is pertinent to mention that Abalone Divers who are not exposed to Noise also have Inner Ear Damage and SNHL as brought out in our article. Stratification of Dive Profiles and the Dive Objective especially with respect to Noise Exposure in a future study may be required to quantify the contribution of the various risk factors towards Inner Ear Damage.

As pointed out in the Letter to the Editor, we agree that ideally, OAE measurements and Pure Tone Audiometry should be done immediately prior to and after a dive. However given the difficulty in achieving sound treated/sound proof conditions to conduct audiometry at the dive site and limitations of logistically covering dispersed Diving Teams with the limited equipment and manpower available, the same could not be done; hence the method of checking for cumulative damage was employed.

Further studies on this subject will probably clear the picture.

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