

Decompression syndrome, ear-plug and barotrauma

Sir,

We read with great interest the paper by Phatak *et al.* which was published in Jul-Sep issue of your journal.^[1] They described a severe case of decompression sickness in a breath-hold diver in India. After stating that no formal education was given to divers regarding diving diseases and preventive measures in India, they imply that diving injuries can be prevented with proper education and training. We hope that this case will ignite a discussion of the problems of divers in India. The authors also recommend that "divers should use ear-plugs for protection from barotrauma". We think that a general recommendation of the use of ear-plugs for divers may be harmful and a clear explanation of how and when to use ear-plugs during diving is required.

Since regular (solid) ear-plugs will totally obstruct external ear canal, a closed space will be created between the ear-plug and tympanic membrane. As other air-filled spaces in the body, this "new" closed space will be subjected to pressure alterations during diving. The air between the ear-plug and tympanic membrane will shrink during descent according to Boyle's law and either the ear-plug will move toward the tympanic membrane or the tympanic membrane will burst to equalize

the pressure inside this space and environment. Ear-plugs may be used during swimming to protect the ear canal from water but it is not recommended during diving because of the increased risk of barotrauma as explained above.

There are commercially available ear-plugs that allow the air to vent, so called "vented" ear-plugs. It is suggested that since vented ear-plugs allow pressure equalization, they may be used in divers to prevent ear squeeze. However, if the hole in the vented ear-plug is closed by ear wax, there is a risk of barotrauma. Furthermore, the data on the effectiveness and safety of vented ear-plugs is anecdotal and no clinical trial has been reported yet.

In conclusion, considering that there is no formal education for divers in India, recommendations to the diving community should be made by being cautious. Solid (non-vented) ear-plugs are not recommended for diving.

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