

# Letters to the Editor

## Isolated inner ear decompression illness

Dear Editor,

I refer to the recent article by Leverment et al, about isolated inner ear decompression illness, in which the authors present a diver who suffered inner ear decompression illness (IEDCI) and was treated by hyperbaric oxygen therapy (HBO<sub>2</sub>).<sup>1</sup>

The literature of the last decade shows that there are a growing number of patients who suffer either isolated IEDCI or neurological DCI combined with inner ear symptoms.

Leverment et al mentioned in their report the retrospective overview of Nachum et al with 24 divers who suffered IEDCI representing 26% of the divers treated for severe DCI during twelve years.<sup>2</sup> In 2002 our working group presented a diver with two episodes of IEDCI combined with a patent foramen ovale who responded well to HBO<sub>2</sub>.<sup>3</sup> This year our hypothesis about a possible embolic mechanism leading to inner ear symptoms was confirmed by Cantais et al, who presented 34 divers with IEDCI, of 101 divers who were treated for decompression illness; 24 of the 34 divers had a major right-to-left shunt compared with 25 of 101 healthy divers in the control group ( $p < 0.001$ ).<sup>4</sup>

In the last six years we have examined nine divers with 11 episodes of IEDCI. All nine divers had a right-to-left shunt of high haemodynamic relevance ( $p < 0.0001$ ).<sup>5</sup> In Belgium, Germonpré reported that 25% of divers treated for neurological decompression illness suffered IEDCI (personal communication).

These figures show that IEDCI is not a rare disease in sport divers and that there is a highly significant correlation between divers with IEDCI and the prevalence of a right-to-left shunt.

As mentioned in the article of Leverment et al,<sup>1</sup> the problem is to find the correct diagnosis as HBO<sub>2</sub> treatment is said to be contra-indicated in divers with inner ear barotrauma. To reduce the risk for divers with inner ear barotrauma, if the correct diagnosis remains unclear, we suggest the following treatment concept: performing a paracentesis of both tympanic membranes allows one to treat a diver as fast as possible with HBO<sub>2</sub>. A paracentesis is a simple technique that can be performed in a few minutes and is commonly practised by hyperbaric units in cases of unconscious, ventilated patients who cannot perform middle ear equalisation techniques.

After paracentesis the diver does not need to perform a Valsalva manoeuvre during recompression therapy, thus

there is no danger of harming a diver who suffers inner ear barotrauma. There is even the possibility that divers with inner ear barotrauma combined with air bubbles in the labyrinth can profit from HBO<sub>2</sub> because of the potential of HBO<sub>2</sub> to reduce inert gas bubbles effectively.<sup>6</sup> When the diagnosis of IEDCI is clear or there are no signs of middle ear barotrauma and the diver can equalise the middle ear without problems there is no need for myringotomy before HBO<sub>2</sub> treatment.

Applying this technique allows one to treat every diver with inner ear symptoms and feasible diagnosis of IEDCI without time lost, and without harmful effects to the inner ear when the final diagnosis turns out to be inner ear barotrauma.

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## References

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## Key words

Letters (to the Editor), inner ear decompression illness, inner ear barotrauma, right-to-left shunt, hyperbaric oxygen therapy