Letters to the Editor PFO and DCS of hyperbaric personnel

I have read with great interest the recent report from Wilmshurst and Edge on recurrent cutaneous decompression sickness (DCS) in a hyperbaric chamber attendant with a large persistent foramen ovale.1 The authors claim within the discussion, "the patient described in this report¹ and the patient in the paper by Colvin and colleagues² are the only cases in which DCS occurred in individuals that had dry occupational hyperbaric exposure with oxygen decompression". I want to draw readers' attention to the recent report from our hyperbaric centre describing several cases of DCS of the hyperbaric attendants after oxygen decompression.³ During 25 years of activity in the National Centre for Hyperbaric Medicine in Gdynia, Poland, during 41,507 hyperbaric sessions, DCS occurred six times in five medical personnel (one person twice). In three cases, skin symptoms of DCS occurred minutes to a maximum of two hours after oxygen safety decompression for nodecompression exposures. In one case, skin symptoms of DCS occurred 15 minutes after no-decompression exposure without extra oxygen breathing. The staff involved did not decide to undergo PFO screening in those four cases; they continued to work in a hyperbaric environment with increased conservatism, and there was no repetition of DCS regardless of age (59, 53, 40 and 28 years, respectively). The other two DCS cases involved one hyperbaric doctor who had spinal DCS for the first time after no-decompression exposure without safety oxygen decompression when 51-years-old; this was described in 2021.4 While risk factors were clearly identified including age, overweight, dehydration and tiredness, a follow-up transoesophageal echocardiogram (TEE) with contrast administration and strain manoeuvre did not reveal the presence of PFO. Interestingly, the same man had a second occurrence of combined spinal and skin DCS five years later, also after no-decompression exposure, regardless of oxygen decompression, for safety reasons.

There is little doubt nowadays that PFO is a risk factor for DCS, especially in the neurological form.⁵ But, on the other hand, I cannot agree with the statement that "individuals, who have a large atrial right-to-left shunt, either a PFO or an atrial septal defect, make up the majority of people who have DCS as a result of working in modern hyperbaric facility". Still, DCS is rare in hyperbaric personnel (0.014%) in our centre, which is one case per 7,000 sessions). In my opinion, more attention should be placed on reducing occupational hazards (repetitive sessions, uncontrolled exercises, extreme temperature exposures) and modifying physiological risk factors (dehydration, poor physical status and non-optimal body constitution) than focusing on PFO as the main reason for DCS of hyperbaric personnel. The old concept of "assume that you have PFO and avoid bubbles at all costs" seems efficient for the medical environment. I cannot recall the primary reference for this citation, but I support Wilmshurst's and Edge's conclusion that "the guidance produced by SPUMS and UKDMC for assessment of divers who might have a PFO is also applicable to other hyperbaric workers such as inside chamber attendants and hyperbaric tunnel workers",⁶ especially before considering PFO closure.

References

- Wilmshurst PL, Edge CJ. Recurrent cutaneous decompression sickness in a hyperbaric chamber attendant with a large persistent foramen ovale. Diving Hyperb Med. 2024;54:354–9. doi: 10.28920/dhm54.4.354-359. PMID: 39675745.
- 2 Colvin AP, Hogg R, Wilmshurst PT. Shunt-mediated decompression sickness in a compressed air worker with an atrial septal defect. Diving Hyperb Med. 2024;54:127–32. doi: 10.28920/dhm54.2.127-132. PMID: 38870955. PMCID: PMC11444913.
- 3 Kot J, Sobczak O, Mlynarczyk B, Sharma R, Lenkiewicz E, Sicko Z. Decompression sickness of medical personnel of a hyperbaric centre: A report of cases during 25 years of activity. Int Marit Health. 2024;75(4):228–35.
- 4 Kot J, Lenkiewicz E, Lizak E, Góralczyk P, Chreptowicz U. Spinal cord decompression sickness in an inside attendant after a standard hyperbaric oxygen treatment session. Diving Hyperb Med. 2021;51:103–6. doi: 10.28920/dhm51.1.103-106. PMID: 33761550. PMCID: PMC8313770.
- 5 Germonpré P, Lafère P, Portier W, Germonpré FL, Marroni A, Balestra C. Increased risk of decompression sickness when diving with a right-to-left shunt: results of a prospective single-blinded observational study (The "Carotid Doppler" Study). Front Physiol. 2021;12:763408. doi: 10.3389/ fphys.2021.763408. PMID: 34777020. PMCID: PMC8586212.
- 6 Smart D, Wilmshurst P, Banham N, Turner M, Mitchell SJ. Joint position statement on atrial shunts (persistent [patent] foramen ovale and atrial septal defects) and diving: 2025 update. South Pacific Underwater Medicine Society and the United Kingdom Diving Medical Committee. Diving Hyperb Med. 2025;55(1):51–55. doi: 10.28920/ dhm55.1.51-55. PMID: 40090026.

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