Asthma in deep water

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Should a history of asthma always be a contraindication for diving?

Diving using scuba (self contained underwater breathing apparatus) began in the 1950s and has since become a popular activity in coastal Australia. In this article, we'll look at whether people affected by asthma can participate in scuba diving.

There is no question that uncontrolled labile asthma is a contraindication to diving. But what about for people with controlled asthma, or with a past history of asthma? Should they also be advised against diving?

Pressure increases with depth. At 10 metres, a diver has double the amount of air in his lungs occupying the same volume (Boyle's Law). On ascending, the diver needs to let this air escape by breathing out. However, if the diver's airways are blocked (eg. by bronchospasm), air can't escape quickly enough and lungs can burst (barotrauma), causing pneumothorax and/or air embolism, with air entering the blood vessels and travelling to the heart or brain with catastrophic results.[1]

Diving is inherently risky. There are an average of 8.8 diving related deaths each year in Australia,[2] with most occurring from decompression illness or drowning. Canadian data has suggested that the risk of death in diving is 1 in 50 000 dives, and that the risk of decompression illness is 1 in 10 000 dives. Australian data suggests that the relative risk for decompression illness in asthmatics is two (ie. double);[3] however, this is not supported by a recent large American study. In the study, which looked at 3339 cases of decompression sickness over 7 years, researchers found no significant difference in air embolism incidence between those with asthma and those without.

To hire or buy scuba equipment in Australia, a diver needs accreditation, which includes medical certification. Most Australian doctors providing diving accreditation use the SPUMS (South Pacific Underwater Medicine Society) guidelines.[3]

International recommendations for diving and asthma vary widely. Through the SPUMS guidelines and the Thoracic Society of Australia and New Zealand position statements,[4,5] Australia has traditionally taken a conservative approach to asthma and diving, with asthma treatment in the past 5 years precluding medical certification. In contrast, the British Sub Aqua Club and the UK Sports and Diving Medical Committee suggest that people with mild, well controlled asthma may dive, with exclusions being cold, exercise and stress triggers or symptoms or reliever treatment in the 48 hours prior to diving.[5]

Faced with these inconsistencies, many diving physicians in Australia and overseas maintain that medical diving certification needs to be an informed decision between the asthma patient and the doctor. Patients with a history of asthma, no current symptoms and good lung function on spirometry should undergo bronchial provocation testing (including exercise, hyperpnoea of dry air and hypertonic saline), which exposes patients to those stimuli experienced in diving. Bronchial provocation testing is available in most lung function laboratories in Australia, and a positive test is a contraindication to diving. Most patients realise during a positive test that diving will be too dangerous for them.

If a patient with asthma receives medical certification to dive, it is my belief that an annual medical review of fitness for diving is prudent, as asthma can change.[6] I recommend repeating bronchial provocation testing 5 yearly, or earlier if there is any significant and prolonged worsening of asthma symptoms. The British Thoracic Society guidelines suggest twice daily peak flow measurement during the diving season; however exercise induced bronchospasm is not always detected by this protocol.[7] Divers with asthma also need to be aware of their triggers (eg. viral infections or allergens) and understand that diving is contraindicated when these are present.

Decisions about diving by people with asthma need to be made individually after careful history, examination and testing (especially bronchial provocation testing), and by thoughtful informed consent, with the patient fully aware of the risks inherent in diving. ♦

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