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Title: Transcranial Doppler ultrasound in commercial air divers: a field study including cases with right-to-left shunting

Authors: Glen, SK  
Georgiadis, D  
Grosset, DG  
Douglas, JD  
Lees, KR

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Abstract: Many cases of decompression illness occur in divers using recommended decompression tables. Doppler ultrasound has been used for over 20 yr and has shown the presence of venous bubbles in asymptomatic divers working well within decompression limits. Previous studies have demonstrated an increased prevalence of patent foramen ovale in divers who have suffered neurologic decompression illness. It has been postulated that right-to-left shunting through a patent foramen ovale could allow arterialization of these bubbles, causing symptoms and signs of acute decompression illness and possibly chronic subclinical neurologic impairment. We set out to determine the incidence of bubbles in the cerebral circulation of commercial divers decompressing from air dives. Using transcranial Doppler ultrasound (TCD), the middle cerebral arteries of 17 divers were monitored after surfacing from depths ranging between 3 and 50 m. Peripheral contrast injection with simultaneous transthoracic echocardiography and TCD was used to screen for right-to-left shunting. Right-to-left shunting was detected in four divers by TCD (one at rest, two after a Valsalva maneuver, and one only after coughing); however, echocardiography was positive in only one of these subjects after a

Valsalva maneuver (TCD was positive at rest in this subject). Seventy-three TCD recordings were performed in four settings: 41 after underwater decompression, 18 after surface decompression, 10 in the interval between surfacing and entering the decompression chamber, and 4 after a chamber dive. Twenty-three of these recordings were in four subjects with right-to-left shunting; no bubbles were detected in any of these recordings. (ABSTRACT TRUNCATED AT 250 WORDS)

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