

EVIDENCE OF ARTERIAL GAS BUBBLES AFTER A DEEP DIVE IN DIVERS WITHOUT RIGHT TO LEFT SHUNT

M. Simonetto¹, G. Vettore², A.Nava¹, M. Gardin¹, L. Zanet³, P. Guarise⁴, G. Didonè¹

¹*Department of Clinical Medicine, Division of Neurology, Azienda ULSS 15 "Alta Padovana", Cittadella Hospital, Padova, Italy*

²*Aquaclubnautilus, Cittadella, Padova, Italy*

³*Department of Specialty and Rehabilitation Medicine, Division of Neurology, "Santa Maria degli Angeli" Hospital, Pordenone, Italy*

⁴*Department of Specialty Medicine, Division of Cardiology, Mater Salutis Hospital, Legnago, Verona, Italy*

Introduction: Decompression sickness (DCS) is a pathological event that occurs during the diver's ascent due to gas coming out of solution forming intravascular and extravascular gas bubbles. It is thought that a right to left shunt (RLS) is necessary for the bubbles to affect the arterial system. To investigate the amount of arterial gas bubbles following a deep dive, we conducted a study performing arterious Doppler sonography of middle cerebral artery (MCA).

Subjects and methods: Six healthy sport divers underwent a cTCD for the diagnosis of absent or present RLS prior the dive. It was a deep dive (50 msw) in a cold lake with SCUBA breathing compressed trimix air (oxygen, helium and nitrogen). cTCD was carried out for at least 5 min after emersion with the subject in seated position focusing on the right MCA.

Results: We had not evidence of RLS by cTCD in our sample. There were not DCS symptoms after dive in our sample. After dive, we detected arterial bubbles in three divers (at least one bubble/cm²).

Discussion: Arterial bubbles without evidence of RLS by cTCD were found in divers. The intra-arterial formation of gas bubbles are thought to be less likely in absence of RLS because the high hemodynamic pressures complicate bubble formation after self-contained underwater breathing apparatus (SCUBA) dives. Our findings show that even in absence of RLS, the occurrence of intra-arterial gas bubble formation is possible. Further studies are needed to confirm this data and to give the meaning of this phenomenon.