

Nitric oxide-related endothelial changes in breath-hold and scuba divers.

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Abstract

OBJECTIVE:

Scuba and breath-hold divers are compared to investigate whether endothelial response changes are similar despite different exposure(s) to hyperoxia.

DESIGN:

14 divers (nine scuba and five breath-holding) performed either one scuba dive (25m/25 minutes) or successive breath-hold dives at a depth of 20 meters, adding up to 25 minutes of immersion time in a diving pool. Flow-mediated dilation (FMD) was measured using echography. Peripheral post-occlusion reactive hyperemia (PORH) was assessed by digital plethysmography and plasmatic nitric oxide (NO) concentration using a nitrate/nitrite colorimetric assay kit.

RESULTS:

The FMD decreased in both groups. PORH was reduced in scuba divers but increased in breath-hold divers. No difference in circulating NO was observed for the scuba group. Oppositely, an increase in circulating NO was observed for the breath-hold group.

CONCLUSION:

Some cardiovascular effects can be explained by interaction between NO and superoxide anion during both types of diving ending to less NO availability and reducing FMD. The increased circulating NO in the breath-hold group can be caused by physical exercise. The opposite effects found between FMD and PORH in the breath-hold group can be assimilated to a greater responsiveness to circulating NO in small arteries than in large arteries.