

Project No : 3738/2007

A Study of ventilatory response to CO₂ in submarines, diving arm volunteers, divers and surface navy soldiers

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OBJECTIVES

To study if prolonged intermittent exposure to elevated inspired fractional concentration of carbon dioxide ($F_i\text{CO}_2$) causes blunting of ventilatory response to CO₂ in divers and submariners and the associated acid base disturbance due to this phenomenon on exercise.

METHODOLOGY

Twenty each of submariners, diving arm volunteers, divers and surface navy soldiers were study subjects. They were subjected to incremental exercise test and their end-tidal CO₂ measured before, after and during exercise. Arterial blood was sampled before and after exercise for presence of post-exercise acidosis and its nature.

RESULTS

Divers and dive volunteers showed a comparable increase in PetCO₂ during exercise which was significantly greater than in submarines and navy soldiers. Two divers and one dive volunteer displayed respiratory acidosis after mild to moderate exercise.

CONCLUSION

The CO₂ retention during exercise seen in divers may be an inherent trait. It may pose a hazard to the diver in certain situations. CO₂ retention during underwater activity may play a role in dive accidents