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Title: Exercise effects on central venous nitrogen tensions after simulated non-decompression dives

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Abstract: In five subjects we examined the effect of exercise on the pattern of central venous (right atrial) N₂ tensions (PVN₂) after ascent from simulated non-decompression dives. The dives consisted of exposure to air at 3 bar for 20 min with 10 min of exercise (workload 75 W) at depth to achieve near-complete N₂ saturation of the muscles. After the dive the subjects rested or, on another day, exercised for 30 min (workload 100 W) starting 10 min after completing the ascent. Blood samples taken every 10 min until the 60th min and 90 min after the dive were analyzed for PVN₂ using a manometric Van Slyke apparatus. The amount of N₂ eliminated was estimated from the PVN₂ by adapting the Fick principle. Immediately after the ascent, PVN₂ were 950 +/- 39 and 942 +/- 27 mmHg, respectively, in the rest and experiment series. In the rest experiments PVN₂ continuously decreased to 606 +/- 8 mmHg 90 min after the dive, remaining significantly higher (P < 0.05) than before the dive. Exercise caused the PVN₂ to increase beyond the corresponding levels of the rest experiments (P < 0.05 at 20 and 30 min exercise). After the exercise PVN₂ rapidly declined, reaching pre-dive levels 60 min after the ascent. Exercise increased N₂ elimination to 970 +/- 143 ml, whereas it had been 311 +/- 61 ml (P < 0.05) in the corresponding phase of the rest experiments. We conclude that if extensive supersaturation and bubble formation can be avoided, such as

probably was the case in our shallow non-decompression dives, exercise after the ascent accelerates N2 elimination.

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