Hypobaric hypoxia-reoxygenation diminishes band 3 protein functions in human erythrocytes

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We have previously shown that subjects exposed to acute hypobaric hypoxia display an erythrocyte membrane protein band 3 with an increased susceptibility to proteolytic degradation. We suggested it was due to an oxidative damage of band 3. We now report that exposure to hypobaric hypoxia followed by reoxygenation affects protein band 3 functions such as anion transport and binding of glyceraldehyde-3P-dehydrogenase. Transport capacity was assessed with the fluorescent probe 2-[N-(7-nitrobenz-2-oxa-1,3-diazol-4-yl)amino] ethanesulfonate (NBD-taurine). Binding capacity was evaluated from the activity of the membrane-associated enzyme. Healthy young men were exposed for 20 min to hypobaric hypoxia, simulating an altitude of 4,500 m above sea level and after recompression band 3 function was assessed. An inhibition of band 3 anion transport function and a decrease in the binding of glyceraldehyde-3P-dehydrogenase to band 3 were observed. Evidence is given supporting the hypothesis that fun