Title: Effects of deep saturation diving on the lymphocyte subsets of healthy divers.

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Keywords: saturation
hyperbaric
lymphocyte
immune

Issue Date: 1994

Abstract: We examined the effect of deep saturation diving on the host defense mechanisms of five healthy volunteers using fluorescein-dye-conjugated monoclonal antibodies. Six divers engaged in a 440-m saturation diving simulation with total hyperbaric exposure of 30 days; five served as subjects. Change in the expression of surface molecules on the lymphocytes was analyzed during that period. Blood samples were serially taken on Days 4, 6, 8, 15, 22, 29, and after surfacing. The total number of lymphocytes showed no remarkable change. However, the fraction of T (CD3+) cells decreased from 68.0 +/- 3.3% to 55.8 +/- 5.8% (Day 8), and B cells increased reciprocally. In these T cells, the CD4:CD8 ratio (normally > 1.0) became less than 1.0 during compression and thereafter. In spite of the prophylactic use of anti-external otitis agents, one of the divers revealed a remarkable growth of Pseudomonas in the external auditory meatus, showing a high level of blood endotoxin (10.2 pg/ml). These results suggest that decrease in CD4+ fraction of T lymphocytes might explain in part the decreased resistance of divers to infective microorganisms in deep saturation diving.

Description: Undersea and Hyperbaric Medical Society, Inc. (http://www.uhms.org)

URI: PMID: 7950801
http://archive.rubicon-foundation.org/2179

Appears in Collections: Undersea and Hyperbaric Medicine Journal

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