Title: Effect of a single exposure to hyperbaric oxygen on blood mononuclear cells in human subjects

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Keywords: HBO
hyperbaric
air

Issue Date: 1993

Abstract: We studied the effect of a single exposure to a therapeutic profile of hyperbaric oxygen on blood mononuclear cell subset. Twenty healthy volunteers were exposed to 0.28 MPa for 90 min. Thirteen breathed pure oxygen and seven were control subjects exposed to compressed air at the same pressure. Venous blood samples were drawn before HBO exposure, immediately on exit from the chamber, and 24 h later. Immediately after the exposure, a significant increase was observed in the percentage and absolute number of CD8 (suppressor/cytotoxic) T cells, with a concomitant decrease in the CD4 (helper/inducer) T cells. These changes resulted in a decreased CD4:CD8 ratio. A rise was also observed in the number of HLA-DR antigen-bearing cells, with a transient increase in monocytes. There was no change in the total count and percentage of T cells (CD3), B cells, and NK cells. Twenty-four hours after HBO exposure there was a partial reversal of the decrease in the mean CD4:CD8 ratio, but it was still significantly lower than preexposure values. The fast reversibility of the change in the CD4:CD8 ratio suggests specific HBO-induced shifts and sequestration of T-cell subpopulations.

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

URI: PMID: 8401149
http://archive.rubicon-foundation.org/2123

Appears in Collections: Undersea and Hyperbaric Medicine Journal

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