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# **Reflex Sympathetic Dystrophy And HBOT**

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## **Title**

The synergistic effect of sympathectomy and hyperbaric oxygen exposure on transcutaneous PO<sub>2</sub> in healthy volunteers.

## **Author**

Thomas PS; Hakim TS; Trang LQ; Hosain SI; Camporesi EM

## **Address**

Department of Anesthesiology, State University of New York Health Science Center, Syracuse 13210, USA.  
hschosp.umag.thomasp.

## **Source**

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## **Abstract**

The benefit of hyperbaric oxygen (HBO<sub>2</sub>) exposure is dependent on the oxygen delivery. Such benefit may be limited by the fact that hyperoxia causes vasoconstriction and decreases blood flow. The aim of this study was to determine whether regional sympathectomy attenuates this vasoconstriction response and thus improves oxygen delivery. In a double-blinded manner, healthy volunteers were subjected to HBO<sub>2</sub> in a monoplace chamber on two occasions separated by at least 1 wk.

Transcutaneous oxygen (tcPO<sub>2</sub>) and carbon dioxide (tcPCO<sub>2</sub>) on the forearm were monitored continuously, and blood flow in the axillary artery was measured using angiodynography before and after exposure to HBO<sub>2</sub>. During one visit, each volunteer received a sympathetic block to the upper extremity by an injection of lidocaine into the brachial plexus at the axilla. During a second visit, the volunteer received a placebo injection of isotonic sodium chloride solution into the brachial plexus of the same side. Skin temperature was recorded on the back of the hand.

All subjects exhibited a small but significant increase in skin temperature (2.5%) and in upper limb blood flow (23%) ( $P < 0.05$ ) after sympathectomy, but not after isotonic sodium chloride solution injection. Sympathectomy increased tcPO<sub>2</sub> marginally while in room air.

However, during HBO<sub>2</sub>, tcPO<sub>2</sub> was substantially and significantly higher (409.8±98.8 mm Hg) after sympathectomy compared with that after isotonic sodium chloride solution injection (171.3±38.1 mm Hg). tcPCO<sub>2</sub> did not change significantly after sympathectomy or during HBO<sub>2</sub>. Thus, sympathectomy presumably improved oxygen delivery by preventing vasoconstriction during hyperoxia. The results suggest that sympathectomy may be a useful adjunct to HBO<sub>2</sub> therapy in patients in whom vascular resistance is increased because of sympathetic tone or hyperoxia.

**IMPLICATIONS:** Sympathetic nerve block of the extremities markedly enhances tissue oxygen delivery during hyperbaric oxygen treatment.

Sympathectomy may be a beneficial adjunct treatment to hyperbaric oxygen in peripheral vascular insufficiency.

Adult ; Blood Gas Monitoring, Transcutaneous \* ; Brachial Plexus DE/PH ; Double-Blind Method ; Female ; Human ; Hyperbaric Oxygenation \* ; Male ; Nerve Block MT ; Oxygen \*AD/ME ; Skin ME ; Skin Temperature DE/PH ; Sympathectomy, Chemical \* ; Vasoconstriction PH

## **Publication Type**

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