Lymphedema

Double-blind randomized phase II study of hyperbaric oxygen in patients with radiation-induced brachial plexopathy.

Pritchard J, Anand P, Broome J, Davis C, Gothard L, Hall E, Maher J, McKinna F, Millington J, Misra VP, Pitkin A, Yarnold JR.

Radiotherapy Action Group Exposure, 24 Edgeborough Way, Bromley, Kent BR1 2UA, UK.
BACKGROUND: Radiation-induced brachial plexopathy (RIBP) is an untreatable complication of curative radiotherapy for early breast cancer, characterized by chronic neuropathic pain and limb paralysis. Hyperbaric oxygen (HBO2) therapy is known to promote healing of tissue rendered ischaemic by radiotherapy, but is untested in RIBP. METHODS: Thirty four eligible research volunteers suffering from RIBP were randomized to HBO2 or control group. The HBO2 group breathed 100% oxygen for 100 min in a multiplace hyperbaric chamber on 30 occasions over a period of 6 weeks. The control group accompanied the HBO2 group and breathed a gas mixture equivalent to breathing 100% oxygen at surface pressure. All volunteers and investigators, except the operators of the hyperbaric chamber and the trial statistician, were blind to treatment assignments. The warm sensory threshold, which measures the function of small sensory fibres, was selected as the primary endpoint. FINDINGS: Pre-treatment neurophysiological tests were grossly abnormal in the affected hand compared to the unaffected hand in both HBO2 and control groups, as expected, but no statistically significant differences were noted in either group at any time up to 12 months post-treatment. However, normalization of the warm sensory threshold in two of the HBO2 group was reliably recorded**.** Two cases with marked chronic arm lymphoedema reported major and persistent improvements in arm volume for at least 12 months after treatment with HBO2. IINTERPRETATION: There is no reliable evidence to support the hypothesis that HBO2 therapy slows or reverses RIBP in a substantial proportion of affected individuals, although improvements in warm sensory threshold offer some suggestion of therapeutic effect. Improvement in long-standing arm lymphoedema was not anticipated, and justifies further investigation.

Can hyperbaric oxygen therapy reduce breast cancer treatment-related lymphedema? A pilot study.

Teas J, Cunningham JE, Cone L, Jansen K, Raghavan SK, Nitcheva DK, Xie D, Butler WM.

J Womens Health (Larchmt). 2004 Nov;13(9):1008-18.

Department of Health Promotion Education and Behavior, Arnold School of Public Health, University of South Carolina and the South Carolina Cancer Center, Columbia, South Carolina, USA. jane.teas@palmettohealth.org

OBJECTIVE: Arm lymphedema after surgery or radiation for breast cancer is common, causing pain and limitation of activities. Previous reports of hyperbaric oxygen (HBO) therapy for breast edema led us to consider the use of HBO therapy for arm lymphedema. METHODS: Ten healthy postmenopausal women (age 58 +/- 5.7 years) with persistent (9.4 years +/- 9.1 years) arm lymphedema following breast cancer surgery and radiation (n = 10) plus chemotherapy (n = 7) received 20 HBO treatments (90 minutes at 2.0 ATA five times a week for 4 weeks). End points included changes in upper extremity volume, platelet counts, plasma levels of vascular endothelial growth factor (VEGF), and lymph angiogenic-associated vascular endothelial growth factor-C (VEGF-C). Lymphedema volume (LV) was defined as the volume of the unaffected arm subtracted from the volume of the affected arm. RESULTS: We observed a 38% average reduction in hand lymphedema (-7.4 ml, 11.6 SD, range -30-+8 ml, p = 0.076, 95% confidence interval -15.7-0.9 ml) at the end of HBO, which was independent of changes in body weight. For those who benefited (n = 8), the reduction was persistent from the end of treatment to a final measurement an average of 14.2 months after the last HBO treatment. However, total LV did not change significantly. VEGF-C increased from baseline (p = 0.004) before treatment 20, suggesting HBO had begun to stimulate this growth factor. CONCLUSIONS: Future studies should explore the effects of a greater number of HBO treatments on lymphedema, with more patients.