

Lung metastatic load limitation with hyperbaric oxygen.

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Source

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Abstract

Despite some theoretical concern about cancer-enhancing effects of hyperbaric oxygen (HBO₂) therapy, it is frequently administered to cancer patients. We evaluated the growth of murine breast cancer cells in the lung after hyperbaric oxygen treatment in an experimental metastasis assay. Young nu/nu mice were injected intravenously with 3×10^3 4T1-GFP tumor cells per g body weight followed by lung isolation, perfusion, and intact organ epifluorescence microscopy 1 to 37 days after injection. A group of animals (n=32) was exposed once daily for 5 days a week to 45 min of 2.8 ATA hyperbaric oxygen (HBO₂) in a research animal HBO₂ chamber. Control animals (n=31) were not subjected to HBO₂ treatment, but received similar intravenous administration of 3×10^3 4T1-GFP tumor cells. Single tumor cells and colonies were counted in the subpleural vessels in areas of about 0.5 cm² of lung surface. HBO₂ treatment did not lead to an increase in the number of the large or small colonies in the lungs. Rather, a significant reduction in the number of the large colonies was observed at 1 and 16 to 21-day periods of measurements after hyperbaric treatment. However, most importantly, there was a significant decrease in large colony size in the HBO₂ group during all periods of observation. The results indicate that HBO₂ is not prometastatic for breast cancer cells; rather it restricts the growth of large tumor cell colonies.

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