

Hyperbaric oxygen as a chemotherapy adjuvant in the treatment of osteosarcoma.

Kawasoe Y, Yokouchi M, Ueno Y, Iwaya H, Yoshida H, Komiya S.

Source

Department of Orthopaedic Surgery, Kagoshima Graduate School of Medical and Dental Sciences, Kagoshima 890-8520, Japan.

Abstract

Although hyperbaric oxygen has been shown to enhance the efficacy of radiotherapy and chemotherapy for the treatment of several malignant tumors, the impact of hyperbaric oxygen on osteosarcoma has not yet been demonstrated. In this study, we investigated the efficacy of hyperbaric oxygen alone and in combination with an anti-cancer drug as an adjuvant to chemotherapy. *In vitro*, highly metastatic murine osteosarcoma cell lines were exposed to hyperbaric oxygen and cell viability was examined. Hyperbaric oxygen alone significantly suppressed cell proliferation, and hyperbaric oxygen plus carboplatin exhibited significant synergism in suppression of cell proliferation. *In vivo*, C3H mice were subcutaneously inoculated with osteosarcoma cells and divided into four groups: control, hyperbaric oxygen, carboplatin, and carboplatin plus hyperbaric oxygen. After 5 weeks, increase in both tumor volume and number of lung metastases was significantly suppressed in the hyperbaric oxygen group. Concomitant hyperbaric oxygen clearly enhanced the chemotherapeutic effects of carboplatin on both tumor growth and lung metastasis in osteosarcoma-bearing mice. Moreover, mortality in the carboplatin plus hyperbaric oxygen group was significantly lower than in the other three groups. These findings suggest that hyperbaric oxygen plus carboplatin combination therapy could be an appropriate therapeutic regimen for the treatment of patients with osteosarcoma.

PMID:

19787219

[PubMed - indexed for MEDLINE]