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Potential roles of hyperbaric oxygenation in the treatments of brain tumors

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Over the past 50 years hyperbaric oxygen (HBO₂) therapy has been used in a wide variety of medical conditions, and one of them is cancer. Many clinical studies have been conducted to evaluate potential therapeutic effects of HBO₂ as a part of cancer treatment. This review briefly summarizes the potential role of HBO₂ therapy in the treatment of malignant tumors and radiation injury of the brain. HBO₂ therapy is used for the enhancement of radiosensitivity in the treatment of some cancers, including malignant brain tumors. Radiotherapy within 15 minutes following HBO₂ exposure, a relatively new treatment regimen, has been studied at several institutes and has demonstrated promising clinical results for malignant gliomas of the brain. HBO₂ therapy also increases sensitivity to some antineoplastic agents; non-randomized clinical trials using carboplatin-based chemotherapy combined with HBO₂ show a significant advantage in survival for recurrent malignant gliomas. The possibilities of combining HBO₂ therapy with radiotherapy and/or chemotherapy to overcome newly diagnosed and recurrent malignant gliomas deserve extensive clinical trials. HBO₂ therapy also shows promising potential for the treatment and/or prevention of radiation injury of the brain after stereotactic radiosurgery for brain lesions. The possibilities with HBO₂ to enhance the therapeutic effect of irradiation per se, and to even increase the radiation dose if there are ways to combat the side effects, should boost new scientific interest into the whole field of oncology looking for new armamentaria to fight cancer.