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An unknown treatment modality for cancer subtypes; Hyperbaric oxygen therapy

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Introduction: This is well known that oxygen is necessary for major processes of a living cell. It also comes true about malignant cells. Incidence of cancer and its morbidity and mortality is rising in our world. Structural and functional abnormalities of tumor vasculature cause hypoxia within the cancer. 100 % oxygen is administered at higher atmospheric pressure in hyperbaric oxygen therapy (HBO). In this way, oxygen dissolves more in plasma and enhances tissue delivery. The questions: What is the fate of cancer cells with HBO? Do they proliferate easier than normal? Does cancer growth increases? May HBO overcome cancer.

Methods: Systematic review of articles in pubmed up to 2015 with related keywords.

Results: HBO is accepted as a therapeutic modality for many disorders in relation to hypoxia. Approved indications have been declared by The Undersea and Hyperbaric Medical Society. Much O₂ is delivered to tissues in HBO. HBO is considered safe. Its complications are rare using update standard treatment protocols. In addition, HBO has inhibitory effects in certain cancer subtypes. Harris (2003) declared cancer cells adapt to hypoxia and their survival and proliferation takes place in this microenvironment. These changes cause tumor progression. HBO may influence the tumor microenvironment in these manners:

- Changing tumor hypoxia to prevent its stimulation effect on angiogenesis,
- Production of reactive oxygen species by hyperoxia to induce excessive oxidative stress for destroying tumors.

Conclusion: HBO is unknown in many countries and they have few centers for HBO treatment. Many animal studies have been done. It seems that HBO may be effective on some cancer cells. Further studies should be done cautiously and hopefully to find the exact answer. Every effort must be done to increase the knowledge of medical society and general population on the effects and mechanisms of HBO in overall and treatment of cancer subtypes in special. It is wisely to found and update HBO centers in the national programs of cancer control.

Biography

Amir Khoshvaghti (MD, PhD) has completed his PhD of anatomical sciences 11 years ago from Shahid Beheshti University of medical sciences. He is the assistant professor and head of department (basic sciences of aerospace and subaquatic medicine faculty) in IRAN. He has published more than 10 papers in reputed journals (English and Farsi). He has also presented more than 30 oral presentations or posters in congresses (international and national)

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