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177. **A BLINDED, CROSS-OVER CONTROLLED STUDY ON THE USE OF HYPERBARIC OXYGEN IN THE TREATMENT OF MIGRAINE HEADACHE.**

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Following approval by our Institutional Review Board, we conducted a prospective, randomized, double-blind cross-over study on this topic. The neurology department selected the patients using the criteria for the diagnosis at least one year prior to study entry of migraine headache as defined by the Ad Hoc Committee on the Classification of Headache of the National Institute of Neurological Diseases and Blindness, the presence of an acute headache typical for that patient despite compliance with prescribed therapy, no narcotic use during this headache, and no contraindications to HBOT. Patients meeting these criteria were randomly entered into the study, and initially received either air or oxygen at 2.0 ATA for 45 minutes. Neither the patient, the neurologist, nor the inside observer knew which gas the patient received during either period. Using the standard subjective evaluation method for headaches, patients reported complete relief, partial relief, and no relief of pain, each patient rated their response. Following a 5 minute air break, the breathing mixture was switched to the other gas, thereby eliminating ethical concerns by providing treatment to all patients, and the response evaluated. Nineteen patients completed the study, with ten receiving air first, and nine receiving oxygen first. No patient experienced any pain relief during their air treatment, and all patients received partial or complete relief following their oxygen treatment. (ANOVA  $p < 0.001$  for partial and complete,  $p < 0.01$  for complete relief). We believe that HBOT represents an effective and economical method for the treatment of refractory migraine headache.

178. **HYPERBARIC OXYGEN AND ACUTE MIGRAINE PAIN: PRELIMINARY RESULTS OF A RANDOMIZED BLINDED TRIAL.** C.E. Fife, J.S. Meyer, J.M. Berry, T.E. Sutton. Department of Anesthesiology, University of Texas Medical School, Houston; Hermann Center for Hyperbaric Medicine; Cerebrovascular Research Laboratory, Veterans Administration Medical Center and Department of Neurology, Baylor College of Medicine, Houston, Texas 77030.

In a previous unblinded study, resolution of acute migraine pain was observed in 92% of patients treated with hyperbaric oxygen (HBO). In this blinded trial, volunteers with migraine documented by trained neurological evaluation and, in most cases, xenon brain blood flow studies, are enrolled prior to headache. Subjects with significant cardiopulmonary disease, pregnancy, narcotic dependency and complaints of chronic "daily migraine" are excluded. Fourteen subjects, 6 males and 9 females, age 23 to 67 years, have received either 100% oxygen at 2 atmospheres absolute (ATA), or a normoxic controlled gas, 10% oxygen/90% nitrogen (nitrox) at 2 ATA via a Scott face mask in a multi-place chamber. The subject, inside attendant, and physician are blinded as to treatment gas, determined from random draw of sealed envelopes. Subjects grade headache pain from 0-5 on a modified Blanchard pain inventory before and after a 45 minute treatment. Treatment is initiated only for scores of 3 or more and in the absence of recent narcotic or other medication ingestion; response is defined as a decrease of 2 or more grades. Subjects failing initial treatment may choose to be re-compressed on alternative gas after 30 minutes of room air observation. Thus all patients have the opportunity to receive HBO. Preliminary results are as follows: 10 patients received HBO initially, of which 7 (70%) obtained headache pain relief; 4 (29%) had no relief. None of 3 HBO failures responded to nitrox. Of the 4 receiving nitrox initially, 2 responded. One of 2 nitrox failures responded to HBO. The overall response to HBO is 72% (8/11), overall response to nitrox is 29% (2/7). Statistically significant results have not been attained due to small sample size. Study limitations include subjectivity of pain assessment, and difficulty in identifying vascular from other headache

syndromes. This on going study is supported by National Headache Foundation Grant #3405.

179. DO CONCERNS THAT HYPERBARIC OXYGEN THERAPY MAY BE CARCINOGENIC IMPACT ON HYPERBARIC MEDICINE PATTERNS: THE RESULTS OF A NATIONAL SURVEY. J.J. Feldmeier<sup>1</sup>, R.D. Heimbach<sup>2</sup>, D.A. Davolt<sup>2</sup>, M.J. Brakora<sup>2</sup>. <sup>1</sup>Division of Radiation Oncology, Department of Radiology, University of Texas Health Science Center, San Antonio, 78284. <sup>2</sup>Department of Hyperbaric Medicine, Southwest Texas Methodist Hospital, 78229.

A questionnaire was sent to 179 clinical hyperbaric medicine facilities to determine treatment policies and referral patterns for patients with a history of malignancy. Eighty-five surveys were returned. Most respondents felt strongly that the available literature failed to demonstrate a carcinogenic effect for hyperbaric oxygen therapy (HBO). However, depending upon the circumstances of therapy (adjuvant or emergent) and the patient's status (past or present malignancy) from 28% to 46% felt that the potential carcinogenic effects of HBO should be part of informed consent. A surprisingly high 45% felt they would be at risk for malpractice litigation if a tumor was re-activated after HBO. This high percentage is at least in part due to negative feelings about the legal system and is not a good estimate of those who are concerned that HBO is carcinogenic. A very small minority had observed or were aware of tumor regrowth after HBO and almost all felt that this occurrence was coincidental. Nonetheless, 10% of respondents believed that HBO was possibly carcinogenic and 16% believed that some of their referring physicians had this belief. A review of the pertinent literature fails to make a case for carcinogenesis. A single report of patients who received HBO as a radiosensitizer showed unusual frequency and patterns of metastasis while all other animal and human studies have been negative. Based on the published literature and the results of this survey it is postulated that HBO can be offered to patients with a history of malignancy without concerns that treatment may be carcinogenic.

180. TRANSCUTANEOUS OXYGEN TENSIONS (PtcO<sub>2</sub>) OF PROBLEM WOUNDS UNDER NORMOBARIC AND HYPERBARIC CONDITIONS. J. Dooley, J. Schirmer, B. Slade. Department of Hyperbaric Medicine, David Grant USAF Medical Center (MAC), Travis Air Force Base, CA 94535.

Pre- and post-HBO therapy wound (WO) and chest (CH) PtcO<sub>2</sub> values (torr O<sub>2</sub>) obtained from patients with problem wounds were analyzed to determine (a) whether various wound types could be categorized by absolute (wound O<sub>2</sub>) and/or relative (wound O<sub>2</sub>/chest O<sub>2</sub> = regional perfusion index, RPI) PtcO<sub>2</sub> values (means, ranges) and (b) whether pre-therapy PtcO<sub>2</sub> values (absolute or relative) were useful in predicting improvement in wound score (Knighton scale) or healing outcome. Wound category types were venous insufficiency (VEN), arterial insufficiency (ART, including diabetic lesions), and traumatic lesions (TRA). Eighty-five (85) consenting patients sequentially breathed normobaric air (21 kPa O<sub>2</sub>) or 100% oxygen under normobaric (101 kPa O<sub>2</sub>) and hyperbaric (239 kPa O<sub>2</sub>) conditions from a clear vinyl hood (Sealong). Mean wound PtcO<sub>2</sub> and RPI values and ranges were so variable under all breathing gas conditions that characterization of wound types by PtcO<sub>2</sub> or RPI was not possible. However, within the established wound categories, characteristic wound PtcO<sub>2</sub> "profiles" were successfully established for plantar (PLA) and edematous (EW) wounds over all breathing gas conditions. Pre-HBO normobaric air (AIR) and oxygen (O<sub>2</sub>) wound responses were not effective predictors of