

Lung Disorders - Bronchitis - Emphysema

Hyperbaric treatment in the post-bronchitic emphysema.

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Following some introductory mention of the physiology of hyperbaric oxygen therapy and some notes on the physiology of postbronchitic emphysema and its cardiac, hepatic, renal and neurological sequelae, a personal method of hyperbaric treatment is described. The results in the first 50 emphysematous patients submitted to this therapy are reported along with those of the examinations carried out to evaluate respiratory function, and changes in haematosi, and cardiac, hepatic, neurological and renal function. It is concluded that hyperbaric treatment of postbronchitic emphysema should be considered of choice for quick, effective resolution of alterations in haematosi and the organic sequelae deriving from respiratory insufficiency. In association with other therapy (antibiotics, anti-inflammatory and balsamic drugs) it is also capable of stopping or usefully delaying the disease's development.

Arterial oxygen tension of patients with abnormal lungs treated with hyperbaric oxygen is greater than predicted.

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The arterial oxygen (O₂) tension (PaO₂) of patients with normal gas exchange treated with hyperbaric oxygen (HBO₂) can be predicted from their pre-HBO₂ arterial to alveolar O₂ tension ratio (a/A) which remains constant up to a PaO₂ of 2,000 mm Hg. We observed that the a/A could not be used to predict the PaO₂ of patients with impaired gas exchange (reduced pre-HBO₂ a/As) treated with HBO₂. Our study provides information about the PaO₂ of patients with abnormal lungs treated with HBO₂. For clinical reasons, we measured the PaO₂ of 24 patients treated with HBO₂. We obtained arterial blood gas values from patients with lung dysfunction (a/A < 0.75) prior to, during, and after HBO₂. The pre-HBO₂ a/A = 0.45 +/- 0.17 (mean +/- 1 SD). During HBO₂ the a/A ranged from 0.7 to 0.8 depending on chamber pressure and returned to the pre-HBO₂ baseline after HBO₂. We conclude the following: (1) The hyperbaric PaO₂s of patients with a/A < 0.75 is greater than expected. (2) However, the PaO₂ is lower than in patients with normal lung function (a/A > 0.75). Possible explanations include improvement in ventilation/perfusion matching, reduction of venous admixture, and/or extra-alveolar uptake of O₂. (3) Exposures to HBO₂ treatment pressures greater than recommended by existing protocols may be required in patients with impaired transfer of O₂ across the lung to achieve PaO₂s similar to patients with normal lung function treated with HBO₂.

Immunological indicators as the criteria of prognosis and treatment of infectious complications in patients operated on for chronic nonspecific diseases of the lungs and pleura

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A correlation of clinical specific features of the postoperative period and dynamics of immunological indices in patients operated upon for chronic nonspecific diseases of lungs and pleura was established. Pyo-inflammatory complications were three times more often in decreased amount of T-lymphocytes after operation. HBO-therapy has an immunostimulating effect in the form of increased total and active T rosette-forming lymphocytes, causes more rapid elimination of purulent intoxication, purification of the pleural cavity from the purulent discharge and makes the period of treatment at the hospital shorter.

Hyperbaric oxygenation in the treatment of patients with acute purulent-destructive lung and pleural diseases

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In experiments in rabbits the authors have elaborated safe (in relation to a barotrauma of the lungs) regimens of the pressure changes taking place while performing HBO. In the treatment of 127 patients with acute

suppurations of the lungs and pleura it was established that a short course of HBO (4-5 sessions) in the regimens used was safe and clinically effective. The method is recommended for the treatment of patients with spreaded injuries of the pulmonary tissue developing with a pronounced endogenous intoxication.

Value of the measurement of the alveolo-arterial PO₂ difference in moderate hyperoxia (FIO₂ = 0.40) in chronic respiratory insufficiency

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Alveolo-arterial difference in PO₂ (AaDO₂) during moderate hyperoxia (FIO₂ = 0.40) and shunt-effect (Q_s/Q_t) were measured in 219 patients with chronic lung disease of various aetiologies. In particular, the series included 79 chronic bronchitics, 35 cases of "primary" emphysema, 40 cases of sarcoidosis and 36 cases of diffuse interstitial pulmonary fibrosis (DIPF). Alveolar PO₂ was calculated from the equation of alveolar air. Ventilatory parameters were measured under stable conditions using a Fleisch metabograph. Shunt-effect (in moderate hyperoxia) was calculated from the classical equation. AaDO₂ in chronic bronchitis was on average 118.3 +/- 30.7 mmHg, significantly higher (p less than 0.005) than in the emphysema patients: 99.2 +/- 22.3 mmHg. The same difference between the two groups was found for shunt-effect (p less than 0.005). In sarcoidosis, AaDO₂ and Q_s/Q_t were only slightly raised on average: 83.6 +/- 22.0 mmHg and 7.2 +/- 3.7% respectively. By contrast, in DIPF, AaDO₂ was very high (124.9 +/- 35.7 mmHg) as was Q_s/Q_t (14.8 +/- 6.9%). The measurement (in moderate hyperoxia) of AaDO₂ and Q_s/Q_t, which are fairly representative of ventilation-perfusion inequalities, may thus make a contribution to the physiopathological differentiation between chronic bronchitis and emphysema. The frank increase in AaDO₂ and Q_s/Q_t in DIPF emphasises the importance of ventilation-perfusion inequalities in the development of hypoxaemia in such patients. For all the cases studied, there was a very satisfactory correlation between AaDO₂ in moderate hyperoxia and PaO₂ at rest in ordinary air (r = -0.64, p less than 0.001). Similarly, there was a satisfactory correlation between Q_s/Q_t in moderate hyperoxia and PaO₂ at rest in ordinary air (r = -0.53, p less than 0.01).

The use of hyperbaric oxygenation in the combined treatment of postresection tuberculous pleural empyema with bronchial fistulae

Mukhin EP, Sarenko VN, Terlikbaev TA, Turkebaeva KA, Alenova AKh.

The results of treating 67 patients with postresection tuberculous empyema of the pleura and bronchial fistulas are presented. The complex treatment included courses of hyperbaric oxygenation. The treatment procedure is described. Closure of the bronchial fistula and decrease in the fistula diameter were observed in 23 (33.8 per cent) and 16 (24.5 per cent) patients, respectively. No closure of the bronchial fistula in 41.7 per cent of the patients was recorded. Increased erythropoiesis, decreased leukocytosis and higher leukocyte counts, retarded ESR, lower contents of transaminases, increased inhibition of leukocyte migration, lower levels of immunoglobulin E and fewer numbers of immune complexes circulating in blood were revealed.