

OXYGEN THERAPY IN EARLY PREGNANCY

Abstract: Oxygen deficiency (hypoxia) is the most frequent factor complicating fetal development; it is an insufficient supply of oxygen to fetal tissues and organs or inadequate utilization of oxygen by them, leading to the accumulation of under-oxidized blood metabolism products, the development of pathological acidosis, disruption of metabolic processes and functions of vital organs.

Keywords: oxygen, treatment, hypoxia, HBO, vitamins A-B-K-R.

The use of oxygen for the treatment and prevention of hypoxic conditions in pregnant women has been going on for more than a decade, but so far there is no consensus on the expediency of its use.

Oxygenation (HBO), which affects the molecular weight of proteins synthesized by the placenta, has become important for the normalization of cellular and tissue processes in the fetoplacental complex [V.E. Radzinsky, P.Ya. Smalko, 2002].

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Since the 50s of the last century, attempts have been made to treat hypoxia with oxygen, but many authors [A.M. Litvinova (1994); V.A. Kulavsky et al. (1996)] it has been shown that oxygen inhalation by various methods is effective only in cases of severe hypoxemia, and in circulatory and hemic hypoxia, the effectiveness of the method is significantly reduced; treatment of histotoxic hypoxia by inhalation of O₂ is practically unsuccessful.

In the mid-60s, a remedy appeared in medicine that made it possible to significantly improve the treatment of hypoxia of various genesis, including hemic. This is hyperbaric oxygenation (HBO) – a method involving a violent increase in the oxygen reserves of the body. At the same time, the partial pressure of oxygen in the pulmonary alveoli increases and, accordingly, the amount of oxyhemoglobin increases, especially oxygen physically dissolved in the arterial blood plasma. This

leads to increased diffusion of oxygen from the arterial portion of the capillary into "hypoxic tissues", which, in turn, take oxygen that is physically dissolved in the blood plasma, and not bound to hemoglobin, which greatly facilitates its flow to the tissues. In addition, dissolved oxygen easily penetrates the placental barrier, diffusing from the plasma through the capillary shells into the pericapillary space. According to V.E. Radzinsky, A.P. Milovanova (2003), the mechanism of the positive effect of oxygen is its ability to restore respiratory enzymes suppressed after hypoxia at the tissue level. Many positive effects of HBO, which are found in the treatment of a number of pathological (including hypoxic) conditions, are not a direct consequence of the elimination of hypoxia, but are due to the influence of oxygen on various levels of adaptation systems.

A comparative analysis of clinical and laboratory studies by K.M. Ryabtsev (2002) showed that HBO improves the function of respiration and blood circulation and is an effective treatment, increases the adaptive capabilities of the cardiovascular system, microcirculation and indicators of the fetoplacental system, and also improves the processes of erythropoiesis, the course of pregnancy and the postpartum period.

At the same time, along with the beneficial effect, hyperoxia can also have a toxic effect. It depends on the duration of exposure, individual sensitivity to oxygen, the influence of related factors: temperature environment, physical activity, density of the gas mixture. According to N.N. Nizova (1988), L.I. Kolesnikova et al. (1996), the prolonged effect of relatively low oxygen pressures causes a pulmonary form of oxygen poisoning. At high partial pressures of oxygen, an acute form of oxygen poisoning develops rapidly due to damage to the central nervous system. There is also a general toxic form of oxygen poisoning with the development of disorders on the part of various organs and systems.

The mechanism of the damaging effect of oxygen is not exactly known. The superoxide theory of oxygen toxicity is widely developed and enriched with actual material, according to which free oxygen radicals have a damaging effect.

Demurov E.A. et al. (1994) proposed the use of natural antioxidants, such as tocopherols, steroid hormones containing SH groups, amino acids (glutamine, cysteine, histamine), ascorbic acid, vitamins A, B, K and R. to prevent the toxic effects of peroxides and free radicals.

Thus, the impossibility of long-term, and most importantly, widespread use of HBO (lack of a sufficient number of pressure chambers, their high cost, the need for maintenance, low throughput) prompted us to test enteral oxygenation by using the product "Oxygen Cocktail".

The appearance of means developed in recent years for enteral oxygenation has become a new possible solution for moderate therapeutic and preventive oxygen saturation of the body. One of such means is the food product "Oxygen cocktail". Enteral oxygenation, being a non-drug and non-invasive means, affecting the homeostasis of the utero-placental complex, affects the pathogenetic mechanisms

of the implementation of placental insufficiency: leveling local hypoxia, restores impaired cellular metabolism and enzymatic insufficiency of decidual tissue, preventing the development of vascularization defects and chorion maturation disorders, and as a result contributes to the prevention of early termination of pregnancy and the development of placental insufficiency when it is prolonged.

Enteral oxygenation does not significantly affect the index of carbon dioxide tension in the blood, normalizing blood oxygenation and improving uteroplacental microcirculation. The results obtained give grounds to recommend enteral oxygenation with an "Oxygen cocktail" in the complex treatment of placental insufficiency in early pregnancy.

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