Hyperbaric Oxygen Therapy

HYPERBARIC OXYGEN (HBO) is a high-dose oxygen inhalation therapy that is achieved by having the patient breathe 100% oxygen inside a pressurized hyperbaric chamber. The delivery of oxygen to the tissues is through respiration because the patient absorbs insufficient oxygen through the skin.

Oxygen is transported by the blood from the lungs into the tissue by two methods: it is bound to hemoglobin in red blood cells, and it is physically dissolved in the plasma. As the chamber is pressurized, the elevated alveolar oxygen tension in the lungs drives oxygen into the plasma, which is then transported throughout the body. Oxygen transport by plasma is the key to hyperbaric oxygen therapy, for even tissue with a poor blood supply can receive oxygen as the hyperoxygenated plasma seeps across it.

While increasing tissue-oxygen levels is a primary therapeutic effect of HBO, other benefits include reducing edema, modifying growth factors and cytokine effects, stimulating more rapid development of capillary budding and granulation tissue formation within the wound bed, promoting cellular proliferation, accelerating collagen deposition, and increasing microbial oxidative killing.

Damaged tissue can have decreased oxygen levels that reduce the activity of several antibiotics, including aminoglycosides, sulfonamides, and fluoroquinolones. By raising the oxygen in ischemic tissue to normal levels, HBO may normalize the activity of these antimicrobials. Additionally, HBO may potentiate the activity of certain antimicrobials by inhibiting biosynthetic reactions in bacteria. HBO can modulate the immune system response and also enhance oxygen-radical scavengers, thereby decreasing ischemia-reperfusion injury.

Although any therapeutic application of hyperbaric oxygenation is intrinsically associated with the potential for producing mild-to-severe side effects, the appropriate use of hyperoxia is one of the safest therapeutics available to the practitioner.

It is unknown if hyperbaric oxygen therapy (HBOT) will cause congenital defects in horses. In human studies it has not been shown to have adverse effects. In our hyperbaric center, we do not hesitate to treat a mare with HBOT, especially when the benefits outweigh the risks. It is not unusual in our clinic, if treating a foal, to allow the mare in the chamber during treatments to aid in the relaxation of the foal.

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