

The Science of Hyperbaric Oxygen

Hyperbaric Oxygen (HBOT) therapy involves inhaling 100% oxygen at greater than one atmosphere absolute (ATA) in a pressurized chamber. (3,5)

HBOT increases the amount of oxygen that is carried in the plasma. (1,2). Typically, hemoglobin which circulates in the bloodstream carries almost all of the oxygen in our body to injured tissues. Only 0.3% of oxygen is dissolved in the plasma which is the fluid in our blood vessels not counting the red cells, white cells and platelets. However, with HBOT therapy, the amount of oxygen dissolved into the plasma can increase many fold. (9) In fact, many animal studies have shown that HBOT can keep an animal alive without circulating red blood cells.

Interestingly, HBOT causes constriction of blood vessels which actually causes decreased blood flow. However, because it increases the amount of oxygen in the plasma so much, the overall result is increased oxygen delivery to injured tissues. (1,2,9). Because Hbot constricts blood vessels it immediately decreases swelling of injured tissue anywhere in the body following traumatic injury. (5,12)

Another property of HBOT therapy is that it has a very potent anti-inflammatory effect on injured tissue in the body. (6,7,12). Several studies have revealed that HBOT has significant anti-inflammatory effects on injured tissue with equivalence to diclofenac. Diclofenac is a NSAID drug like Motrin, however, it is 10 times as potent as Motrin. With just one HBOT treatment it would have the physiological effect on injured tissue in the body as taking 14,000 mg. of Motrin, without the deleterious effects that someone would expect ingesting that quantity of Motrin.

HBOT therapy has also been known to decrease markers of inflammation including, IL-1, IL-6 and TNF-alpha in humans. (7) The partial pressure of oxygen on the body at sea level or 1.0 ATA absolute is 160 mm Hg. In a hyperbaric oxygen chamber at 1.3 ATA absolute and breathing 95% oxygen through a properly fitted mask, the partial pressure of oxygen can be raised to 891 mm Hg. The net effect of HBOT is actually a dichotomy in medicine as it decreases blood flow from constriction of blood vessels, which reduces swelling of injured tissue and increases oxygenation in the injured tissue which decreases inflammation (1,2,5,6,7,12)

Given all the indications above, HBOT is extremely beneficial to patients suffering from both acute and chronic musculoskeletal conditions and when administered at pressure greater than 1 atmosphere, oxygen can assume properties akin to a miracle drug without any of the side effects. (3,4,5,10,11,12).

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