Macular Degeneration Reversed with HBOT

Bojic L., Gosovic S., Kovacecic H., and Denoble P. Hyperbaric Oxygenation in the Treatment of Macular Degeneration. Spilt, Yugoslavia: Split Naval Medical Institute, pp. 1-4.

Dr. L. Bojic treated 4 patients with advanced macular degeneration and severe vision loss in a clinical trail with HBOT. Three of the four patients experienced a doubling of visual acuity after HBOT. The fourth patient experienced a four-fold improvement.

Although much more research is needed and HBOT is still considered experimental in this condition, it seems that a trial of **thirty 60-minute treatments at 1.5 ATA** in a monoplace HBO chamber, combined with other therapies such as laser and nutritional supplements, offers hope for additional benefit. This makes good sense, because cells of the retina are specialized neurons−actually an extension of the brain. Retinal cells would therefore be expected to respond to HBOT, similarly to brain-injured patients.

Hyperbaric Oxygen

Last week I treated a patient from Colorado who lives at 5000 feet who is suffering from macular degeneration. I have another patient who lives at 6500 feet in the White Mountains of Arizona who also has macular degeneration.. Several questions came into my mind. What are the affects low oxygen saturations at this altitude? Is this contributing to the development of macular degeneration? Will increasing his oxygen saturation help improve his vision? Could Hyperbaric oxygen treatment help his condition?

Oxygen is essential to good health and low oxygen saturation to tissue will cause disease. It is well documented in the medical literature that people with low oxygen saturation will have a greater incidence of macular degeneration. This includes living at high altitude, sleep apnea, tobacco abuse and chronic pulmonary disease. All of these conditions will reduce the oxygen saturation to the body.

Any condition that reduces the oxygen saturation needs to be corrected. All of our patients who are being treated for macular degeneration and other eye problems are evaluated for conditions that can reduce the oxygen saturation. Low oxygen saturations are more common at night especially with patients with sleep apnea, lung disease and chronic sinus infections. A simple test is done at night called a Nocturnal Pulse Oximetry. This measures oxygen saturations throughout the night. Low values are a call to action to evaluate and treat the reason.

What are the affects at high altitude? At 5000 feet there is a 20% reduction in oxygen saturation, at 10,000 feet a 30% reduction. This reduction in oxygen saturation can be a problem especially if there are other conditions which are effecting the utilization of oxygen.

What is hyperbaric oxygen and can it correct low oxygen saturation? Henry's Law states that gas dissolved in a liquid is proportional to its partial pressure. At sea level the atmospheric pressure is 760 mm Hg and the oxygen saturation is 21%. At higher altitudes there is a reduction in oxygen saturation; 5000 feet a 20% reduction and at 10,000 feet a 30% reduction. What happens when we increase the atmospheric Pressure?

By placing someone in a pressured hyperbaric environment, the increase in atmospheric pressure increases the partial pressure of the oxygen gas and thus forces more oxygen to be dissolved in the plasma. This saturation of oxygen in the blood allows the extra oxygen to be diffused or transported to the surrounding body tissues. Thus, oxygen transport by plasma is significantly increased under hyperbaric therapy (HBOT). At three atmospheres pressure, enough oxygen can be dissolved in the plasma to support the oxygen demands of the body at rest in the absence of any blood!

The Use of Hyperbaric Oxygen Therapy in Ophthalmology

Hyperbaric oxygen therapy is a primary or adjuvant therapeutic method used in treatment of various acute or chronic disorders. Currently, eye diseases are among the off-label use of hyperbaric oxygen. However, there is an increasing body of evidence showing its safety and efficacy in retinal artery occlusion, cystoid macular edema secondary to retinal vein occlusion, scleral thinning and necrosis faced after pterygium surgery, orbital rhino-cerebral mucormycosis, nonhealing corneal edema, and anterior segment ischemia. Its potential to treat some blinding disease has also been pointed out in recent studies. This article constitutes an up-to-date summary of knowledge and therapeutic use of hyperbaric oxygen, and aims to contribute understanding of current and potential use of hyperbaric oxygen therapy in ophthalmology.

Dr. Robert Rowen, editor of 2nd Opinion Newsletter, mentions a report by Drs. Jansen and Nielson from Copenhagen, Denmark, which details two case histories of ARMD patients improving with HBOT. Both patients had cystoid macular degeneration. One patient, a type-2 diabetic, went from a visual acuity of 0.5 (difficulty reading), to 1.0, where he could read normally, with just one treatment. The second patient's visual acuity was only 0.2; he could not read at all. After **five sessions** of HBOT in three days, his acuity was 0.9, where he could read normally. These Denmark doctors saw a "very rapid," day-by-day improvement in the macula and recommend that treatment be started as early as possible, before there is irreversible damage.

Hyperbaric Oxygenation in the Treatment of Macular Degeneration.

Split, Yugoslavia: Split Naval Medical Institute, pp. 1-4. Bojic L.

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Hyperbaric Oxygen Therapy and Age-Related Macular Degeneration.

Age-related macular degeneration (AMD) is a significant cause of visual loss in the United States and Western Europe. As the population ages, the prevalence rate of advanced AMD is expected to double by 2030. A **one-hour session** of hyperbaric oxygen therapy (HBO2) was used to treated a group of 14 patients with advanced AMD. Eight patients were treated at 1.75 ATA, and six patients were treated at 1.5 ATA for one hour. Significant improvements in visual acuity and/or visual field, with improvements in the activities of daily living were observed.

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Hyperbaric Oxygen Therapy Reduces Visual Field Defect After Macular Hole Surgery

Department of Ophthalmology and Visual Sciences, Nagasaki University School of Medicine, Nagasaki City, Japan.

BACKGROUND AND OBJECTIVE:

One of the serious complications that may arise after macular hole (MH) surgery is a temporal visual fields (TVF) defect. We hypothesized that hyperbaric oxygen (HBO) therapy improves the visual field (VF) in these patients.

MATERIALS AND METHODS:

Vitrectomy for MH was performed on 73 eyes from 1994 to 1997. TVF defect was detected in 19 eyes and, of that 19, 12 patients were followed. Seven patients were treated with HBOT therapy and 5 were controls. HBOT was performed for approximately 110 minutes a day with 100% oxygen inhalation and a maximum of 2.8 atmospheric pressure. This continued for 20 days. The preoperative VF determined by kinetic perimetry was considered to be 100%, and the VF following HBOT therapy was compared with that standard.

RESULTS:

We detected VF defect (postoperative VF area average 71.9+/-12.8% of the preoperative VF). In all 5 patients who had no HBOT therapy, TVF defects remained, while the TVF recovered remarkably in all patients treated with HBOT therapy. The VF recovered to 81.7+/-16.7% of the preoperative VF **after 3 days of HBOT,** and to 91.6+/-15.8% months after HBOT therapy.

CONCLUSION:

We speculated that the cause of TVF defect is likely to be chorioretinal circulation disturbance during surgery, and that HBOT activates the retinal cells and improves VF. We conclude that HBOT is useful in the treatment of TVF defect after macular hole surgery.

HBOT for Macular Degeneration

Looking for new treatments for macular degeneration? One alternative treatment is hyperbaric oxygen therapy, also known as HBOT.

Oxygen deficiency is part of the cause of AMD, because lack of oxygen hampers the cells in pumping out toxins, resulting in inflammation that hinders the generation of new blood vessels in injured tissues. This in turn results in more inflammation and swelling that causes increased oxygen deficiency, a vicious cycle.

Hyperbaric oxygen therapy infuses needed oxygen into damaged cells under pressure. HBOT dissolves oxygen into your body, diffusing it everywhere, even into hard-to-reach inflamed and swollen areas. It brings hyperbaric oxygen to the retina and to the macula.

Robert Jay Rowen, M.D., says that his friend, David Steenblock, DO, of Mission Viejo, California has had success with hyperbaric oxygen therapy for AMD.

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