



ANDI International

74 Woodcleft Ave.
Freeport, NY 11520
516-546-2026

Hyperbaric Oxygen Halts Inflammation

Edward A. Betts

Many of today's debilitating conditions have a common component. It is not cholesterol or "bad genes" or simple aging. Have you or a loved one dealt with pain, obesity, ADD/ADHD, peripheral neuropathy, diabetes, heart disease, stroke, migraines, allergies, thyroid issues, dental issues, Lyme disease or cancer? If you answered yes to any of these disorders you are also speaking about inflammation. Inflammation describes purely the body's immuno-vascular response, whatever the cause may be. Conditions and diseases ending in the suffix "-itis" are describing a specific type of inflammation.

Many diseases are the result of chronic inflammation. Alzheimer's, rheumatoid arthritis, heart disease, Crohn's disease, diabetes, high blood pressure and cancer all have a link to inflammation. Many inflammatory diseases begin with an autoimmune reaction which progresses into systemic inflammation.

When stress picks up inflammation is initiated by increased levels of iNOS (inducible nitric oxide) which causes an immediate increase in intestinal permeability much like elevated cortisol levels from stress. Once this occurs serum protein particles leak through the intestine walls and become extremely reactive. Gluten is an extremely common serum protein in a situation of increased permeability. High stress, poor eating habits, poor sleep patterns are all contributory but related as in an ever increasing cycle.

Your immune system will then begin to recognize these "leaking proteins" as other similar proteins like cerebellum, thyroid, etc... This can induce symptoms that are apparently unrelated to stomach or intestinal issues. Serotonin levels fall, melatonin levels fall; increased fatigue, poor sleep and increased anxiety are prevalent. Even endocrine dysfunction can result. Unrelated pain and loss of mental acuity are also often presentations. When antibodies combine with our structural proteins, inflammatory chemicals are created called cytokines, which can be damaging to brain function. In fact, elevated cytokines are seen in such devastating conditions as Alzheimer's disease, Parkinson's disease, multiple sclerosis and even autism.

The term "cytokine" is derived from a combination of two Greek words - "cyto" meaning cell and "kinos" meaning movement. Cytokines are cell signalling molecules that aid cell to cell communication in immune responses and stimulate the movement of cells towards sites of inflammation, infection and trauma.

The most current terminology used to describe cytokines is "immunomodulating agents" or agents that modulate or alter the immune system response. Cytokines are important regulators of both the innate and adaptive immune response. Cytokines exist in peptide, protein and glycoprotein (proteins with a sugar attached) forms. Examples of cytokines include the agents interleukin and the interferon which are involved in regulating the immune system's response to inflammation and infection.

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A particular cytokine may exhibit:

Autocrine action by binding to receptor on the membrane of the same cell that secreted it.

Paracrine action binding to receptors on a target cell in close proximity to the producer cell.

Endocrine activity by traveling through circulation and acting on target cells in distant parts of the body.

Cytokines can regulate cellular activity in a coordinated interactive way due to the following attributes:

Pleiotrophy - one cytokine has many different functions.

Redundancy - several different cytokines can mediate the same or similar functions.

Synergism - occurs when the combined effect of two cytokines on cellular activity is greater than the additive effects of individual cytokines

Here is a partial list of diseases that have a relationship to inflammation:

| <i>Disease</i> | <i>Mechanism</i> |
|--------------------------|--|
| Allergy | 4 Immune Mediated Types + Sensitivities, all of which cause inflammation |
| Alzheimer's | Chronic inflammation destroys brain cells |
| Anemia | Inflammatory cytokines inhibit erythropoietin production |
| Ankylosing Spondylitis | Inflammatory cytokines induce autoimmune reactions against joint surfaces |
| Asthma | Inflammatory cytokines induce autoimmune reactions against airway lining |
| Autism | Inflammatory cytokines induce autoimmune reactions in the brain arresting right hemisphere development |
| Arthritis | Inflammatory cytokines destroy joint cartilage and synovial fluid |
| Carpal Tunnel Syndrome | Chronic inflammation causes excessive muscle tension shortening tendons in the forearm and wrist compressing the nerves |
| Celiac | Chronic immune mediated inflammation damages intestinal lining |
| Crohn's Disease | Chronic immune mediated inflammation damages intestinal lining |
| Congestive heart failure | Chronic inflammation contributes to heart muscle disease |
| Eczema | Chronic inflammation of the gut and liver with poor detoxification and often antibodies against Transglutaminase -3 |
| Fibromyalgia | Inflamed connective tissue often food allergy related and exacerbated by secondary nutritional and neurological imbalances |
| Fibrosis | Inflammatory cytokines attack traumatized tissue |

| | |
|-------------------------|---|
| Gall Bladder Disease | Inflammation of the bile duct or excess cholesterol produced in response to gut inflammation |
| GERD | Inflammation of the esophagus and digestive tract are nearly always food sensitivity and pH driven |
| Guillain-Barre | Autoimmune attack of the nervous system often triggered by autoimmune response to external stressors such as vaccinations |
| Hashimoto's Thyroiditis | Autoimmune reaction originating in the gut triggered by antibodies against thyroid enzymes and proteins |
| Heart attack | Chronic inflammation contributes to coronary atherosclerosis |
| Hepatitis | Inflammation of the liver |
| Kidney failure | Inflammatory cytokines restrict circulation and damage nephrons and tubules in the kidneys |
| Lupus | Inflammatory cytokines induce an autoimmune attack against connective tissue |
| Multiple Sclerosis | Inflammatory cytokines induce autoimmune reactions against myelin |
| Neuropathy | Inflammatory cytokines induce autoimmune reactions against myelin and vascular and connective tissues which irritate nerves |
| Pancreatitis | Inflammatory cytokines induce pancreatic cell injury |
| Psoriasis | Chronic inflammation of the gut and liver with poor detoxification |
| Polymyalgia Rheumatica | Inflammatory cytokines induce autoimmune reactions against muscles and connective tissue |
| Rheumatoid Arthritis | Inflammatory cytokines induce autoimmune reactions against joints |
| Scleroderma | Inflammatory cytokines induce an autoimmune attack against connective tissue |
| Stroke | Chronic inflammation promoted thromboembolic events |
| Surgical complications | Inflammatory cytokines (often pre-dating the surgery) slow or prevent healing |
| Vasculitis | Inflammation of blood vessels including both arteries and veins |

Conquering inflammation is a cornerstone of anti-aging medicine. Managing inflammation is a primary prophylactic and can reverse many chronic conditions. New scientific research now shows how hyperbaric oxygen therapy (HBOT) reverses inflammation in a healthier and safer method than pharmaceuticals. Also HBOT has minimal adverse side-effects. HBOT is one of the safest medical modalities available today.

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Researchers and forward-thinking doctors have been putting patients into hyperbaric chambers to breathe oxygen at 1.5 - 2.5 times normal atmospheric pressure for all kinds of problems for more than 40 years. And it has worked on patients from children with cerebral palsy and athletes with sports injuries to victims of chronic and slow-healing medical conditions. We now know why it works so well on inflammation.

Of course, all inflammation isn't bad. You need it when you have a cut or a broken bone. Without this "acute" inflammation, your body wouldn't heal, because no white blood cells from your immune system could migrate to the site of the foreign bodies attacking you.

There are also low-level inflammatory responses that you can't see; those that go on for years and slowly kill, such as cancer and other chronic diseases. Inflammatory triggers are all around us. These include environmental toxins and pollutants, stress, poor diet, excess weight and cigarette smoke. Inflammatory proteins can also be activated by live bacteria, as well as xeno-compounds and hormone-disrupting chemicals, like Bisphenol A (BPA)¹.

But recent research reveals the power of HBOT in the battle against chronic inflammation. A study published in 2015 tested the impact of HBOT on lab mice with spinal cord injuries. Inflammation was running rampant in the mice. But after a series of HBOT sessions, it became clear that the pressurized oxygen had "inactivated" inflammation and began the repair and reactivation of the nerves.²

The explanation is simple. Breathing pressurized oxygen raises the concentration of oxygen in the blood plasma and tissues, thereby increasing the number of oxygen molecules getting through without having to increase the flow of red blood cells to the area. The body attempts to maintain a constant delivered level of oxygen and therefore contracting blood vessels in the body. This is called vaso-constriction. **Oxygen is a powerful and immediate vaso-constrictor.** Also like jump-starting your car the oxygen jolt activates sleeping or idling cells to get them working again, allowing their repair mechanism to go into action. That repair mechanism begins by inactivating the inflammatory proteins.

Proper Oxygen levels are required to encourages the regeneration of tissues, blood vessels and nerves. Hyperbaric oxygen does it better! A maintenance schedule of only once a week in the chamber can add years and better quality to your life. A management program of HBOT for a healthy over-40 is likely to result in a healthy over-80. ***Do not only add years to your life, add life to your years!***

References:

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