

LIVING WITH GLAUCOMA

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NYEE

INFLAMMATION AND ITS EFFECT ON GLAUCOMA

Inflammation in the eye characterizes a condition most commonly called Uveitis. Basically, inflammation is a universal response of living tissue to some form of injury prevalent in all living creatures. Four classic signs originally described in Greek times still hold true. These are:

>Rubor = redness

>Tumor = swelling

>Calor = warmth – increase of blood flow to that area

>Dolor = pain

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Additionally, there is also loss of function that qualifies as a fifth condition. Commonly, when an inflamed body part results in swelling, function is lost or hampered.

Where does inflammation come from? Although we possess many organs in our body – heart, kidney, liver, and so on, no specific organ is responsible for inflammation. But the immune system designed to protect the body from infection when signaled that an invader is present creates inflammation to zap the foreign agent.

While the immune system consists of several different parts, the white blood cells play the major role. The immune system also possesses lymphatics embracing lymph channels and lymph nodes. The skin is a part of the immune system. The bone marrow and the thymus create the white blood cells along with to some degree the gastro-intestinal tract. There are different types of white blood cells, also called leukocytes. These are agranulocytes, monocytes, neutrophils, eosinophils and basophils. The agranulocytes commonly are activated during allergic reactions.

The neutrophils mobilize against infection. They are the advance crew and are the most important cells in patients with Uveitis or inflammation related to glaucoma.

Inflammation has many uses, one of which is its response to an injury. For example, inflammation increases blood flow to

the affected area accounting for along with water the swelling of the tissues, thereby diluting any toxins. It also creates antibodies, molecules in the blood that recognize any foreign material at the site of injury. Scar formation, while sometimes unsightly, is the body's response to sealing the injured tissue.

Increased blood flow brings more nutrients to the injured cells helping them to recover. When white blood cells identify foreign material, they release digestive enzymes to kill off bacteria. But these enzymes may be non-discriminating killing off healthy tissue in the process.

Harmful effects of inflammation are limited because for the most part it occurs only for a limited period of time. For example, if you stub your toe, it will become inflamed and swell a condition that subsides after a short period of time. Unfortunately, in some cases, the inflammatory response continues exposing the body to harmful effects such as prolonged swelling of tissues leading to other problem.

Dr. Samson gave an example of a patient who did not visit her doctor when she experienced a sinus problem that then led to other problems. The sinuses are the spaces in the skull, actually all around the eye. In some cases the bacteria in an untreated sinus condition may migrate to the eye socket area and multiply and spread. Obviously, this is an even grimmer

scenario. Another disastrous problem may occur if and when bacteria enters into the brain causing a lethal infection.

Inflammation can occur in any part of the eye including the lids and the surface of the eye. When on the surface, it is termed conjunctivitis, a fancy term for pink eye. A bacterial infection may occur in the wall of the eye, the sclera, or in the iris, or deeper in the eye in critical structures in the back of the eye such as the retina or the optic nerve.

Doctors are trained to diagnose and treat inflammations in these different areas. Inflammations can result from many different causes. Bacteria and viruses account for a small percentage of Infectious Inflammation, but most inflammation against these structures is created as a result of the autoimmune system's vigilance by MISTAKE. Only 10% of inflammation in these structures are infectious; the rest are autoimmune.

Inflammation of the uvea is most commonly seen in glaucoma. The Uvea is from the Greek term designating a grape because of its appearance upon dissection. The uvea is composed of three parts, representing the middle layer of the eye. The outside layer essentially comprises the wall of the eyeball, the inside layer, the retina and the optic nerve. Think of the middle layer as the meat part of the sandwich. In the front of the eye, the uvea is called the iris and close by the ciliary body which produces the fluid in the eye responsible for eye

pressure, and sandwiched between the wall of the eyeball and the retina lies the choroid, the blood supply to the eye.

The uvea has a very vascular structure and when inflamed it is called Uveitis. Any inflammation affecting the inner parts of the eye is termed Uveitis. This condition must be diagnosed by a slit lamp machine. It cannot be diagnosed with an MRI or CAT Scan for these instruments do not produce enough high resolution for diagnosis.

Uveitis is not considered a common problem for only .8% of the population is affected. Because of this, most eye doctors hardly see a case in a year; at the most, one or two cases a year. But here's the rub. The top three causes of preventable irreversible blindness places Uveitis at Number 3. Diabetes in the United States is the most common preventable irreversible cause of blindness. Glaucoma comes in at Number 2. These statistics do a U-turn when applied to African-Americans. With this group glaucoma is the Number One leading cause of irreversible, preventable blindness.

Cataracts are not on this list for cataracts, while not preventable are reversible. Macular degeneration because while vision loss is not preventable nor reversible, effective treatment exists. Uveitis is Number 3 because doctors don't have the tools to prevent vision loss in most patients. Unfortunately, at the present state of the art, there is a high

chance of severe loss if not blindness. Glaucoma ranks high because the incidence of the disease is high in the population.

Inflammation in the eye causes pain, redness, sensitivity to light. The inflammation affects the inside layers of the eye including the ciliary body. Because of the iris opening and closing depending on the light source, when inflammation is present bright light may be irritating if not painful. Many patients with Uveitis are sensitive to light and they also experience blurred vision.

An eye doctor treating a patient with Uveitis tries to unravel the possibility of prior infections and administer a battery of blood tests in an attempt to identify the cause. The list is long.

To simplify diagnosis of Uveitis Dr. Samson divides the causative conditions into categories. This practice makes it easier to understand by eliminating the learning of 104 different possibilities. This total list is broken down into five groups. First is appropriate Uveitis or appropriate inflammation. As mentioned, inflammation is a normal response to injury. It may not be healthy or good for the eye but that's what the immune system is designed to do. For example, if you have cataract or glaucoma surgery, the eye becomes inflamed and typically will be inflamed from about 4 to 6 weeks following surgery. In some cases, unfortunately,

surgery causes injury to the eye, and the inflammation continues for weeks and in some cases years. For example, during cataract surgery, an unusual eye configuration or condition surfaces, and the doctor unable to place the lens implant in the capsule, placed it in front of the capsule, closer to the eyelids. At times this alternative site causes the lens implant to touch the iris, causing impairment. Every time the lens touches the iris, the eye recognizes a trauma. This is an injury that creates inflammation producing chronic iritis and chronic Uveitis. Another example involving cataract surgery common in the eighties is an allergic reaction to silicone, the lens material used at that time.

Appropriate inflammation is the body's immune system response to injury and infections.

We also diagnose parasitic infections for toxoplasmosis, a type of parasite. Not every kind of infection causes Uveitis, but many of them do. Eye doctors look specifically for those particular infections known for creating eye infections. For example, a common type of infection, shingles, the virus remaining in the body following a childhood infection of chicken pox. While the disease confers immunity to chicken pox later on in life, this immunity does not deter a variant form of shingles that remains in the body and which will often reappear in the presence of a weakened immune system. The human immune system cannot eliminate the chicken pox virus

but, thankfully, for most patients, their immune systems are strong enough to suppress the chicken pox/shingles virus from rearing its ugly head. Unfortunately, as we age, our immune systems weaken, particularly in times of stress or illness, exposing us to the possibility of a shingles outbreak. The virus morphs from a whole body infection that is spread by the blood to the shingles variant traveling along nerves. Shingles, therefore, affects one area of the body, typically a part of the face, or the torso.

Many times, the immune system strengthens and knocks out the virus without treatment. But once the virus settles into a part of the body, it can be very painful. Doctors treat some patients with anti-virals to boost the immune system's ability to dispatch the virus. With some patients the shingles virus infects the eye. When it does so, the situation becomes problematic. Eye doctors, expecting shingles to appear on the skin, may actually miss this condition.

Another source of infection may emanate from Lyme disease. Although Lyme disease typically is believed to be mainly present in wooded areas inhabited by deer or field mice, it may not be limited only to these areas. Dr. Samson has found that many patients who avow they haven't been in the woods, are found to have this particular infection. Lyme disease can be detected with blood testing. But because Lyme disease causes

many other symptoms such as arthritis; it can be very difficult to diagnose. Once diagnosed, Lyme disease can be successfully treated with an antibiotic regimen.

Sexually-transmitted disease can also cause infectious Uveitis, but diagnosing it can be problematic for the virus may have been contracted years earlier preceding its current outbreak.

Autoimmune Uveitis is a phenomenon where the immune system has made an error, creating inflammation in the absence of a trigger. No injury or infection can be detected. Naturally, we desire to know why the immune system is acting up and possibly an immunologist can trace the root of the problem.

Arthritis is a common condition of autoimmune disease affecting the joints. The condition may flare-up perhaps during a change of seasons. Unfortunately, some patients experience the immune system's failure to shut down after a flare-up and the symptoms continue to plague year round, requiring medication to relieve the pain.

Many types of autoimmune diseases are the third leading causes of health problems on the same level as cardiovascular (heart and stroke), and cancers. The largest group falls into autoimmune disease categories. It's not clear why the autoimmune diseases such as asthma, arthritis and sarcoidosis have

increased in the past few years and are now major sources of health problems. We call the autoimmune diseases by different names -- at the joints, knees, it is termed rheumatoid arthritis, the lungs either asthma or sarcoidosis, the brain, multiple sclerosis. the eye Uveitis.

For the most part, inflammation inside the eye cannot be attributed to a particular infection nor has the patient necessarily had surgery. This is when the doctor performs the previously mentioned blood testing in an attempt to pinpoint the source of the inflammation. Occasionally, there is a match, but most often, the Uveitis is considered to be an inappropriate response.

Sometimes a patient can be genetically predisposed to auto-immune disease, such as with a family history of lupus. These patients can have a routine, uncomplicated surgery, but because of family history, they get inflammation and possibly Uveitis.

The most dreaded inflammatory response arises from an eye infection. A small amount of bacteria may enter the eye during eye surgery. It is not evident at the time of surgery, but after a few days, the eye becomes inflamed and vision is affected. The body is battling the bacteria, and the bacteria is fighting to proceed in multiplying. The incidence of this happening following a cataract surgery is 1 in 100,000. The

rates for glaucoma surgery are higher. Should such a situation occur, the chance of vision loss is increased.

Whether the outcome of inflammation develops from an infection or following the trauma or surgery steers its course for inflammation has both beneficial and harmful effects. How badly one does is related to how badly the harmful effects impact on vision. Problems may occur in different guises as stated below.

Macular edema, the swelling of the macular or the swelling of the optic nerve can occur. The optic nerve problem is called Optic Edema. A scar can occur on the iris. In some patients with Uveitis who have not had surgery, the cause can actually be from a cataract. Also, Uveitis can lead to glaucoma.

Glaucoma and Uveitis. The primary problem may be Uveitis with glaucoma as the secondary problem, but the opposite may be true. There are two ways people with eye inflammations experience this problem. The first stems from damage to the drainage system by clogging it with inflammatory debris that results in elevated pressure requiring a trabeculectomy or the implantation of a seton tube to allow fluid drainage. The natural outflow system is permanently damaged when the patient has glaucoma.

It can also be the other way around. Patients with glaucoma can get Uveitis. For example, an infection of shingles

in the eye shoots up the eye pressure. The virus destroys the drainage system of the eye.

A rarer condition considered autoimmune is the Possner-Schlossman Syndrome. This infection produces minimal inflammation but results in a large pressure build-up, at times rising into the 50's. When this occurs, the patient becomes aware that something is very wrong with the eye. This form of glaucoma is treated with steroid drops that reduce the pressure, unlike in cases when steroids are used to manage inflammation and the pressure rises as a result

Pigmentary Dispersion Glaucoma is not to be confused as an inflammatory disease. It is an entirely different problem. Confusion may arise in the examination of the eye under a slit lamp. The pigmentary cells are not actually inflammatory cells, but pigment cells. The confusion may arise in an attempt to distinguish these cells from inflammatory cells. Basically, the difference lies with the color – the inflammatory cells are white and the pigmentary cells are brownish.

Uveitis can be divided into three or four different categories: auto-immune, appropriate, inappropriate and post-surgical. Treatment is differentiated according to the condition, but the effects of the conditions are similar.

Infection treatment is based on the source of the infection. If it's bacterial—antibiotics; if viral such as shingles,

an anti-viral; parasitic, an anti-parasitic anti-biotic. Obviously, treating Uveitis requires a practiced specialist in the disease for diagnosing the source is critical to cure or at least control.

Steroids are usually the best treatment for inflammation, Should eye drops be ineffective, oral steroids are used, but doctors try to avoid the complications that might arise from oral treatment. Another form of administration consists of injecting a steroid containing capsule directly into the eye. Should glaucoma result from the use of steroids, unhappily, the condition is not reversible.

Twenty to twenty-five percent of patients develop glaucoma following steroid treatment. The doctor, therefore, will use different strengths of steroid medications seeking the lowest strength possible to tame the inflammation. For example, Pred Forte at 1%. If a more potent medication is needed, Durasol is prescribed. This medication may more frequently cause glaucoma. Weaker steroid medications such as Lotomax, Apraxsolom, or Pred-Mild are not as effective. Generally doctors will adjust the medication in an attempt to use the lowest dose possible and yet be effective in controlling inflammation. Treating a patient who has both glaucoma and Uveitis requires a skilled and knowledgeable doctor.

REVERSING VISION LOSS.

This subject is ever present for people who have a vision-threatening disease. Dr. Samson's lab is engaged in seeking a solution. The retinal and nerve cells that carry the signals from the retina to the brain are most important for vision. These cells do not regenerate. The number of remaining cells determines the state of vision.

Stem cells form the crux for restoring vision. The stem cell is a cell that has not yet received the signal for differentiation. Dr. Samson's team is one of a handful currently enrolling in clinical trials to treat patients with an injection of retinal stem cells.

Since it's a clinical trial, no results are as yet available, but Dr. Samson's team has two patients scheduled to get retinal stem cell implants who have lost vision from macular degeneration. They are as excited as is the Team and hopeful that they will be among the first patients to report that their conditions have been reversed from blindness to sight and will signal an end condition to a treatable condition.

Glaucoma, unfortunately, is more complicated. Retinal cells can be injected in the retina and if successful, the patient sees again. For glaucoma, the stem cells must follow a more complicated route from the retina to the visual cortex via the

ganglion nerves. Most challenging. But in the field of spinal cord injury progress is being made. The pathways are similar.

Summary. Uveitis is an inflammation in the eye that can cause damage leading to vision loss. Glaucoma can be commonly associated with or cause of Uveitis.

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ANSWERS TO QUESTIONS:

Dr. Samson believes each person's immune system is as individualized as fingerprints and he, therefore, cannot make any reliable recommendation.

No studies indicate consistent benefit from diet and exercise. Stress, however, has been shown consistently to rev up the immune system. With Uveitis, a revved-up immune system is detrimental. To manage inflammation, Dr. Samson recommends managing stressful situations wherever possible.

Stress management through meditation can benefit inflammation disease. Specific examples are hard to come by because it's very individual, but Dr. Samson has witnessed real benefits and reduction in medications when patients adequately managed their stress responses.

DIET AND VITAMINS:

Dr. Samson mentioned the paucity of fresh, unprocessed foods at the supermarket. The data shows dietary changes can be very, very individual. Scientifically, our teeth, or bodies were designed for meat eating. We weren't necessarily designed to eat greasy hamburgers.

Dr. Samson recommends examining how the human body developed. What was the early diet? Obviously, people ate from the land--fruits, nuts, a little bit of meat. We're not designed to drink cow's milk for example. We do the best we can with resources available. As for Vitamins, Dr. Samson again recommends moderation.

ACUPUNCTURE:

The National Institutes of Health in 1992 looked at arthritis in a controlled trial. Some patients would receive the needlepoints for arthritis; those receiving the acupuncture felt better, but the doctors do not know how it works.

Certain acupuncture treatments don't work. A lot of acupuncturists try to treat viral disease and blood pressure but there are no proven results in this quarter.

Some patients have received acupuncture points around the eye, and it totally affects the eye but again there is a mystery about how it works.

Marijuana clearly can lower eye pressure. But there are no studies that indicate that Marinol treatment reduces the chances of vision loss.

BLOOD PRESSURE AND EYE PRESSURE

There is not a direct relationship although there are many patients with elevated blood pressure with normal eye pressures and the medications for elevated eye pressure do not normalize low blood pressure. There is an indirect relationship, however, for if you examine all patients with high blood pressure, incidence of glaucoma is higher than in the general population. The relationship is not a known one. It's probably not a direct one. In other words, you probably can't treat glaucoma solely by treating the blood pressure.

Low blood pressure is a very complicated matter, not very well understood. There are patients with normal eye pressure who have glaucoma.

We want to thank Dr. Samson for his detailed and comprehensive analysis of inflammation and its effect on the human body and especially on the eyes. We consider Dr. Samson a friend of the Group for whenever we invite him to speak he spends precious hours with us, taking time out of his busy schedule, to respond to our concerns and our questions.

Please note: The contents of this newsletter are for informational purposes only. The Content is not intended to be a substitute for professional medical advice, diagnosis or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition.

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