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Age-Related Macular Degeneration

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Everyday hundreds of patients are diagnosed with Age-Related Macular Degeneration (AMD) in the United States. AMD is the leading cause of legal blindness in Americans over the age of sixty-five.

The macula is responsible for our sharp central, detail vision which we use to read, see colors and safely drive a car. The damage and deterioration to this area of the retina creates distortion and a blindspot in the center of a person's vision which makes it very difficult for a person to read, see faces, and see to do other daily activities.

Statistics of AMD

Age-Related Macular Degeneration will reach epidemic proportions over the next 20-30 years. The National Eye Institute, a division of the National Health Institute, estimates that AMD costs society approximately 30 to 40 billion dollars each year. The incidence of AMD in the United States is approximately 10 to 14 million people and the Beaver Dam Study estimates that approximately thirty percent of all those over the age of 70 will develop AMD. As the "Baby Boomer" population ages, macular degeneration cases will only continue to soar with approximately 70 million Americans being over the age of 65 by the year 2030.

Risk Factors for AMD

There are many risk factors which have been identified for

developing AMD. These include: age, having blue eyes, family history of AMD, smoking, lifetime sunlight exposure, farsightedness, cardiovascular disease, high cholesterol, lack of estrogen use, low intake of carotenoids and little physical activity. In recent studies, the link between long term UV sunlight exposure and AMD has emerged as a possible risk factor for developing AMD and therefore, wearing protective sunwear may be beneficial.

"Wet" Versus "Dry" AMD

Macular Degeneration can be in two different forms, "dry" and "wet". The "dry" form of macular degeneration is a slowly progressive vision loss that results from a deterioration of the macular region. Approximately 85 to 90 percent of all macular degeneration cases are of the "dry" form. In AMD, small yellow deposits form under the macula leading to a drying and deterioration of the macular region. The amount of vision loss is directly correlated to the amount or size of the retinal damage. Dry macular degeneration is usually a much slower loss than the "wet" type. However, some of those with "dry" AMD will develop "wet" AMD.

The other type of macular degeneration is called "wet" AMD. This type of macular degeneration is much more serious and visually threatening. "Wet" AMD occurs when the retina forms abnormal blood vessels to supply the macula. These new vessels grow underneath the retina, but are very leaky. The blood vessels can hemorrhage under the retina causing a sudden and dramatic drop in vision. As the blood is reabsorbed into the retina, there is extensive scarring that occurs, leading to visual distortions and a loss of visual acuity.

Common Visual Problems with AMD

Decrease in Visual Acuities:

There are many different ways that macular degeneration can affect a patient's vision. The most common symptom with AMD is a decrease in visual acuity. AMD patients first notice they are not reading as well as they used to and that their vision is hazy or gray in the center. They can use their side vision, but this is not 20/20 visual acuity. Once outside the macula region visual acuity drops rapidly to 20/200 to 20/400 visual acuity.

Good Days & Bad Days:

Also, many AMD patients report "good days and bad days" with their vision. This is quite common with many ocular diseases, and a patient's vision may seem worse on certain days. Lighting conditions, general health fluctuations and/or fluid changes in the retina are all common causes of daily variations in vision.

Distortion or Waviness in Vision:

Another common symptom is visual distortion or waviness in the

patient's vision. As the macula region scars, it causes a stretching or distortion of the retina, leading to distortion in the image they see. Window blinds or light poles may seem bent or crooked due to the damage in the retina.

Come & Go Vision:

Additionally, patients report "come & go" or "now I see it, now I don't" vision. When AMD starts to deteriorate the central vision, the patient will experience a blindspot in the center of their vision. When they look off to the side using their peripheral retina they see the item, but when looking directly at it, it seems to disappear often causing great frustration.

Eccentric Fixation:

People with AMD may turn their head or eyes to one side or the other in order to see better. What they are doing is moving the macular scar out of the way and using their good peripheral vision for viewing. This turning of the eyes or head is called eccentric fixation and is often confused with the remaining peripheral vision. This is a common problem with AMD and the peripheral paradox a patient experiences. In AMD, a patient's peripheral retina and side vision is always intact. A person with AMD may spot a small piece of paper on the floor, but reports they cannot see your face. They are using their side vision to locate the paper. If they turn to look directly at the paper, it will disappear as they align their damaged macula on it. This is why family members or friends may think the patient sees better than they really do.

Light Sensitivity & Photostress:

Other major visual problems from AMD are light sensitivity and photostress. Many AMD patients are extremely bothered by bright lights both indoors and out. The scars in their eyes act as a mirror reflecting light internally within the eye. This causes a lot of light sensitivity and a glare or haziness in their vision. Additionally, AMD patients notice their vision drops when coming inside from bright sunlight. Their damaged retinal cells cannot regenerate their retinal chemicals quick enough, and therefore, their vision may be worse temporarily after coming indoors out of the sunlight. This is similar to the black spot we see for a few seconds after having a picture taken with a bright flash. Hats and sun filters are a must in AMD patients.

Decrease in Color Vision & Depth Perception:

Because the cone cells in the macula region are responsible for the majority of our color vision, AMD patients report a muting or dullness in colors. Additionally, a person with AMD may have difficulty with depth perception and have problems judging steps. Whenever a person loses vision, depth perception is one of the first things to decrease, because it is a very sensitive function that requires two perfectly working eyes. Increasing light may aid color vision.

Phantom Vision (Charles Bonnet Syndrome):

In some patients who have severe vision loss, they may see visual phantom images. Patients commonly see images they know are not there, but keep this to themselves for fear of being misunderstood by their family or labeled as mentally unstable. This condition is called Charles Bonnet Syndrome. Charles Bonnet, a Swiss Naturalist, first described this condition in his grandfather. In a severely visually impaired person, they look at an object and because of the severely damaged retina, the image is very distorted. This distorted image is transferred to the brain where the brain tries to decipher the image, but it ends up recalling an image from our memory and making it as vivid as our dreams. It is the brain misinterpretation of the visual image that is seeing and it is not a psychiatric condition.

Treatments for AMD

Antioxidant Therapy:

Many research studies are being conducted for possible treatments and cures of AMD. The Age-related Eye Disease Study (AREDS) which was published in the Archives of Ophthalmology in October of 2001 was the first multi-center study that proved that nutritional supplements in high doses may decrease the risk for further vision loss from macular degeneration. This study found approximately a 27% decrease in vision loss for those patients who used antioxidants plus zinc combinations in high doses. These results were for those persons designated as a high risk for more vision loss. This study affirmed the use of antioxidants and zinc and their beneficial properties in reducing the progression of AMD. Before beginning any nutritional supplement regime, it is important to consult your eye care professional or physician to discuss the side effects of taking high dose supplements and assessing the benefit to you.

Photodynamic Therapy:

Early detection and regular monitoring is crucial when dealing with macular degeneration. In the last few years, there has been a new treatment available for "wet" macular degeneration. Photodynamic Therapy (PDT) uses the drug, Visudyne, to slow or stop the progression of AMD. After the drug is injected into the arm, a mild laser light activates the medication in the location of abnormal blood vessel growth in the macular. It may take up to three treatments, but in some, it results in a regression of the abnormal blood vessels and decreases the risk for significant vision loss. Wet AMD must be caught early before hemorrhaging occurs in order to do PDT. Therefore, it is imperative to monitor an Amsler Grid chart for any new distortions and have regular dilated eye examinations. Low Vision Care: For those who have lost vision to AMD, low vision care will address the functional limitations including difficulty reading, driving, watching television and performing other activities of daily living. Low vision specialists are doctors of optometry or physicians trained in ophthalmology that provide rehabilitation for

patients with visual diseases and disorders. These specialists work to improve a person's functioning by maximizing the remaining vision the person has. When patients have difficulty reading a newspaper, a book or their mail, handheld magnifiers, special microscopes, high powered reading glasses or video magnification systems may be a great benefit when reading. These provide adequate magnification along with the right lighting to help patients read easier. Additionally when watching television, moving closer to the TV may help or special telescopic systems can be prescribed for distance viewing. To decrease glare and light sensitivity indoors, special filters can be use in the patient's general eyewear. Also wearing adequate sun protection outdoors will decrease a patient's light sensitivity and photophobia. If driving becomes difficult for the patient, there are other options available to keep patients with mild vision loss on the road. These include a waiver of the visual acuity requirement or by bioptic driving. Bioptic driving is where one undergoes extensive training on the use of a special telescopic device for spotting road signs and traffic lights while driving. Low vision care helps people keep their independence by educating and prescribing aids to help people read, drive, watch TV and do many other daily tasks. The low vision specialist may also recommend therapy or training from occupational therapists, rehabilitation teachers and/or driving rehabilitation specialists.

Summary

Macular degeneration is a progressive loss of our sharp, central vision which limits our ability to read, drive and see faces. There are numerous problems that a person with AMD experiences including a loss of visual acuity, color vision, depth perception and a distortion in their vision. Additionally, light sensitivity, photostress and phantom vision are other common problems people have with AMD. Research on this condition is providing new hope in slowing the progression of the disease with new treatments like photodynamic therapy and taking high dose antioxidants and zinc. For persons who have lost vision or are experiencing visual problems due to AMD, low vision care by a low vision specialist allows many to maintain their independence with the use of adaptive aids. Special devices including microscopes, magnifiers, video magnifiers and bioptic systems can help a person with AMD read their mail, see medicine bottles, write checks, watch television, see dials and perform many other activities of daily living that become difficult with AMD.

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Dr. Laura Windsor is a Doctor of Optometry and Low Vision Rehabilitation Specialist at the Low Vision Center of Indianapolis. Dr. Windsor received her Doctorate of Optometry from the Indiana University School of Optometry, where she

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Dr. Windsor has published articles on low vision rehabilitation and is currently co-authoring a book chapter on the low vision considerations in brain injury. Additionally, Dr. Windsor co-authors a quarterly column on low vision for Vision Enhancement Magazine.

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