Age-Related Macular Disease

Main Number ................................................................. 215-928-3000
Physician Referral ...................................................... 1-877-AT-WILLS
                                                                   1-877-289-4557
Emergency Service ....................................................... 215-503-8080

Retina Service .............................................................. 215-928-3300
Cataract and Primary Eye Care Service .................. 215-928-3041
Contact Lens Service ................................................... 215-928-3450
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Pediatric Ophthalmology and ................................. 215-928-3240
Ocular Genetics Service
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Laser Vision Correction Center .......................... 215-928-3700

To learn more, please visit us at www.wills eye.org
Age-related macular degeneration (AMD) is a common degenerative eye condition affecting people age 50 years and older. There are no known specific causes of AMD although there is evidence for genetic predisposition and environmental/dietary influences.

The image one sees is focused by the cornea and lens of the eye and then cast upon the center of the retina or macula. (Diagram) Any condition that damages the macula may be associated with some degree of central vision loss such as loss of the ability to read or see someone’s face.

There are two major types of AMD, a “dry” (non-neovascular) and a “wet” (neovascular) form. The dry form is the early stage and is the most common form of AMD. There is usually little or no vision loss during this stage although there are exceptions with some people having significant vision loss from more advanced “dry” degeneration. The wet form is a late stage of the condition and affects about 10 percent of all people with the condition. Wet AMD accounts for the majority of central vision loss due to AMD. The wet stage is when abnormal blood vessels start to grow beneath the center of the macula and, as they grow, they leak fluid or blood and cause central vision loss with blurring and distortion of vision. Untreated, these abnormal blood vessels typically will grow relatively large and eventually cause scarring with permanent and often severe central vision loss.
Many people with dry AMD have no visual symptoms at all. Occasionally, significant loss of central vision can occur, but the loss of vision with dry AMD is usually gradual or slow. People with wet AMD often have more rapidly progressive loss of central vision, typically over weeks or months. Visual distortion is a common symptom of this stage.

Dry AMD

There is no treatment yet to halt the progression or recover any vision loss from dry AMD. However, the Age Related Eye Disease Study (AREDS) demonstrated that a specific formulation of anti-oxidant vitamins and minerals can reduce the risk of progression of dry AMD to more advanced stages. The components of the AREDS formula are as follows:

- 500 mg Vitamin C
- 400 IU Vitamin E
- 15 mg Beta-carotene
- 80 mg Zinc oxide
- 2 mg Copper oxide

Detection

A comprehensive ophthalmic examination with pupillary dilation is important in the assessment of AMD. People with AMD may have one or both of the following tests to evaluate the disease.

Fluorescein angiography is a commonly used, office-based diagnostic test that can aide in determining the extent of macular degeneration and help distinguish between the dry and wet forms of the condition. It utilizes a yellow dye (fluorescein) injected in an arm vein followed by a series of photographs of the retina over a 5-10 minute time-frame. (Figure 1)

Optical Coherence Tomography (OCT) is a non-invasive, office-based imaging technique that uses a low energy scanning laser to obtain cross-section views of the macula and determine whether there are signs of wet AMD. It is a commonly used test to help diagnose wet AMD and follow the response to treatment.

Treatment

Dry AMD

There is no treatment yet to halt the progression or recover any vision loss from dry AMD. However, the Age Related Eye Disease Study (AREDS) demonstrated that a specific formulation of anti-oxidant vitamins and minerals can reduce the risk of progression of dry AMD to more advanced stages. The components of the AREDS formula are as follows:
It is important to check with your medical doctor before starting this AREDS supplement. In general, Vitamin E supplementation should not exceed 400 IU, and smokers should not be on any Beta-carotene supplementation due to an increase risk of lung cancer.

There are other potentially beneficial micronutrients such as luetin and xeaxanthin but these have not yet been proven to be helpful in treating dry AMD. Based on epidemiologic studies, the following lifestyle and nutritional changes may be beneficial:

1. Stop smoking. Smoking has been associated with more advanced forms of AMD.
2. Eat a diet rich in colorful vegetables and fruits. These food groups have been associated with lower rates of progression to advanced AMD.
3. Consider eating food rich in Omega 3 fatty acids. Omega 3 fatty acids are found in cold water fish and are associated with less severe AMD.

**Wet AMD**

There are more effective treatments available now but still no cures exist for AMD. Treatments include new drugs aimed at blocking growth factors, nondestructive laser-drug combinations, and traditional laser photocoagulation.

**Anti-Vascular Endothelial Growth Factor (VEGF) Agents:**

**(Lucentis) Ranibizumab**

The most recent treatment development for wet AMD was the FDA approval of Lucentis (ranibizumab) in 2006. This was the first treatment shown to improve vision in many people with wet AMD. Lucentis is administered in the office by an intraocular injection and typically dosed monthly for the first few treatments.

The injection is very well tolerated being relatively painless and only rarely associated with any complications. Treatment may need to continue for an indefinite time frame to keep the condition stable, although the frequency and total number of injections may vary considerably from person to person.

Lucentis is an antibody fragment that works by blocking an important growth factor of choroidal neovascularization called vascular endothelial growth factor (VEGF.) By blocking VEGF, both the growth and leakiness of the abnormal blood vessels is reduced. Studies with patients on a course of Lucentis showed that 70% of people on treatment will maintain or improve vision and 30% to 40% of people have relatively large degrees of visual improvement. However, there can still be vision loss despite ongoing Lucentis therapy.
Avastin (Bevacizumab)
Avastin (bevacizumab) is another drug used to treat wet AMD. Avastin is FDA-approved for use in people with certain types of cancer. Like Lucentis, Avastin is an antibody to VEGF and administered by an intraocular injection on a regular basis to treat the condition. Although using Avastin in this way is considered off-label, there is considerable clinical experience and many published studies that indicate that Avastin is beneficial for people with wet AMD. At this time, the clinical impression of retina specialists is that Avastin is comparable in safety and effectiveness to Lucentis. A large multicenter trial is being conducted to compare the two medicines.

Macugen (pegaptanib)
Macugen (pegaptanib) is another drug that blocks VEGF. It was the first approved intraocular injection therapy for wet AMD, but is generally considered to be less effective than Lucentis and Avastin.

Photodynamic Therapy (PDT)
Photodynamic therapy (PDT) with Visudyne (verteporfin) is another treatment for wet AMD. It utilizes an intravenous injection of a photosensitizing drug called verteporfin (Visudyne) and a non-thermal laser light to attempt to reduce leakage from certain types of choroidal neovascularization. The treatment is performed in the office and often repeated at 3 month intervals. Typically, it does not improve vision when used alone. It is still used occasionally, but as adjunctive treatment to Lucentis or Avastin.

Laser Photocoagulation
Thermal laser photocoagulation may be used in certain, rare cases of wet AMD where the abnormal blood vessels are not beneath the center of the macula. Thermal laser treatment attempts to destroy choroidal neovascularization but also damages the surrounding retina to some degree. Accordingly, this procedure is typically considered only when the abnormal blood vessels are far from the center of the macula. (Figure 2)
Commonly Asked Questions

Will this condition affect my other eye?
It is estimated that the risk of the wet type of macular degeneration affecting the other eye is approximately 10% per year. For this reason, self-testing and regular check-ups are essential.

Are my children likely to inherit this disease?
Approximately 20% of cases are in patients with an affected parent. Therefore, there is a possibility that your children could develop signs of AMD later in life.

If I have a cataract, will removing it improve my vision?
That depends on both the severity of the cataract and on the severity of underlying macular disease. Your ophthalmologist can advise you about this.

Does macular disease mean I am more likely to have a stroke or a heart attack?
Age-related maculopathy involves only the central portion of the retina. As far as we know, age-related macular degeneration is not directly related to “hardening of the arteries,” which can cause stroke or heart attack.

Is there any financial assistance available for people who have lost vision?
There may be financial aid for people whose best-corrected vision with glasses is 20/200 or worse, or whose visual field is restricted to 10 degrees or less. They also might be eligible for an additional income tax deduction as well as other financial and rehabilitative benefits to help them cope with vision loss.

People with vision slightly better than 20/200 might be eligible for rehabilitative service. For more information on financial, social and rehabilitative assistance, contact the Pennsylvania Office of Vocational Rehabilitation at 215-557-7112 (toll free 1-888-745-2357) or the State of New Jersey Commission for the Blind at 973-648-3333 (toll free 1-877-685-8878).
Home Test for Macular Disease

- Hold this grid at normal reading distance, using reading glasses if appropriate.
- Cover one eye.
- Look at center dot.
- Note any size of wavy or fuzzy lines in the grid.
- Test other eye.
- If changes in eyesight seem apparent, contact your ophthalmologist.
- Repeat test on a regular basis.

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One of our core strengths is the close connection between innovative research and advanced care. Wills physicians pursue research that can be quickly translated into clinical care. Our tradition of excellence has also made Wills a premier training site for all levels of ophthalmic medical education, and a leader in innovative, high tech community outreach efforts.

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