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MACULAR DEGENERATION

Age-related macular degeneration (AMD) is the leading cause of poor vision in people over 60. (It is sometimes found at younger ages, but that is rare.) When the macula is damaged (or degenerates, as from AMD), central vision is interfered with, so that when you look at an object straight on, part of it may seem distorted, blotted out, or shrouded in a dark haze.

The macula is a key part of the retina, the light-sensitive nerve tissue at the back of the eye that forms the "screen" upon which images are focused. Though the macular area is tiny, no larger than a pinhead, it contains all the cells needed for central vision - seeing straight ahead, seeing fine detail, and crisp color vision - in other words, the sharpest, most useful part of vision.

AMD usually involves both eyes, though it may start in one eye and not affect the other eye until much later. Most people with even advanced AMD do not lose all of their vision. No matter how poor central vision gets, your peripheral vision - the outer edge of your visual field, which does not depend on the macula - should stay useful. You should continue to be able to see off to the sides.

What Causes AMD?

Scientists have not yet learned why a macula that has functioned well for most of your life begins to degenerate. Heredity is likely to play a role, as well as years of exposure to bright sunlight. It is also possible that tissue changes that accompany the normal aging process somehow interfere with the macula getting enough oxygen. Smokers and former smokers have been found to have a much higher risk of AMD (though stopping smoking does not reverse the degeneration or even slow it down). Other risk factors are hypertension and heart disease. Some studies have found a relationship between macular degeneration and a high intake of saturated fat, but those findings are not conclusive. It is not caused by using your eyes too much.

People who develop AMD are typically in good health. The condition does not appear to be caused by diabetes or by drinking alcoholic beverages. In fact, drinking a moderate amount of wine (especially red wine) daily has been shown to decrease the odds of developing AMD.

Drusen

As the normal eye ages, tiny yellowish deposits called "drusen" sometimes build up under the macula. The "hard" form of drusen may be a normal and harmless sign of getting older, but "soft" drusen can be a sign that degenerative macular changes are starting to develop. Yet AMD sometimes develops without any visible drusen at all.

Types of AMD

There are two major forms of AMD, called "dry" and "wet." Most patients have the dry form, which tends to develop slowly as the tissue (pigment epithelium and visual cells) beneath the macula gradually deteriorates. With wet AMD, tissue deterioration is accompanied by tiny abnormal blood vessels called "subretinal neovascular membranes." These form under the retina and start to leak fluid or bleed. If the fluid or blood reaches the macula and lifts it out of position, vision becomes distorted and visual sharpness can be lost.

Symptoms

The typical first symptom (in either form) is blurring of vision. When the blurring is gradual, you may think you need new eyeglasses. But a new prescription is not likely to improve your vision because the problem is not with the optical parts of the eye.

As time goes on, you may notice a hazy or dark zone in the center of objects you look at directly. Colors may begin to look different or lose richness. With wet AMD especially, straight lines, such as the edges of doorways, may start to look bent or crooked as vision becomes distorted and wavy. Symptoms may be gradual or sudden (suddenness is more likely with wet AMD). When the loss of vision is in one eye only, you can't always tell how long it has existed, since it is "hidden" when both eyes are used together. It may only become apparent when the good eye is covered.

Some people whose vision has been very poor (from AMD or from other causes) sometimes have visual hallucinations; they see things (objects or patterns) that are not really there. These phantom visions can last from a few seconds to a minute or so and then disappear. Such hallucinations are fairly common and they are not serious, but they are startling. Even so, people who have them generally don't talk about them freely.

Examination

Your vision will be checked and you will have a refraction (test for glasses) along with a complete eye exam. Your pupils will be dilated (enlarged) with eyedrops so that the insides of your eyes can be evaluated with an ophthalmoscope. A special type of contact lens may be used for examining both retinas and maculas under the high magnification of a slit lamp microscope.

Photographs may be taken of the retina, to determine the extent of the problem and evaluate its progression. You may also have a retinal "angiogram," retinal photographs that help identify the position and extent of any abnormal blood vessels or leakages. For this test, called fluorescein angiography (FA), an orange-colored dye (fluorescein) is injected into a vein in your arm and then a series of photographs is taken as the dye travels through the eye's blood vessels. If more information is needed, a dye called indocyanine green (ICG) may be used to make another type of angiogram. Angiograms provide important guidance for treatment.

Treatment

So far, there are no medications that have proven to be effective. But wet AMD - in the early stages only - can sometimes benefit from treatment with a surgical laser, to seal the leaks or destroy the abnormal blood vessels under the macula. (The laser cannot help the dry type of AMD, or even most stages of the wet type.) The goal of laser treatment is to prevent further leakage and stabilize vision. Only occasionally does vision improve. Please don't expect miracles; the laser treatment may not help at all and vision may even get worse.

Laser surgery is never undertaken lightly. No matter how accurately performed, it involves some risk to vision because the laser can destroy normal neighboring tissue along with abnormal tissue. So the procedure will be recommended only if the risk to your vision is small and there is a reasonable chance for success - that means that the degeneration is not too extensive, too advanced, or too near the center of the macula.

Research

Major clinical research is ongoing at many centers. New treatment and prevention methods are constantly being sought. Certain antioxidants, vitamins, and minerals are being studied as a way to slow the degeneration. Scientific evidence for their effectiveness is still inconclusive; some studies show beneficial results, others don't. (Until there are answers, you may decide to take a regular vitamin-mineral supplement for whatever help it might offer.) Several national studies are evaluating the effect of radiation therapy, especially low-dose X-rays to the eye, to treat the abnormal subretinal blood vessels. Other studies are

aimed at understanding and controlling angiogenesis - the process by which new blood vessel membranes form under the retina in wet AMD. The results are not in yet.

Several new surgical treatments are under investigation: pigment epithelial transplants, the use of laser burns to "treat" soft macular drusen, subretinal surgery to remove neovascular membranes, and macular translocation (surgically moving the macula to one side). Another new treatment is called photodynamic therapy (PDT), in which a light sensitive dye, verteporphin (Visudyne) is injected into the arm. It travels to the retina, where it concentrates in the abnormal blood vessels under the macula; then a low intensity red laser is used to destroy these vessels with less damage to the normal cells in the area. This treatment is usually repeated 3 to 5 times over a year or more, and has been shown to be modestly effective in several national studies. All of these potentially useful treatments must be viewed as experimental at this time.

What To Expect

AMD usually develops gradually or in small spurts over many months, then slows down or stops. Both eyes will probably be affected, though one eye may precede the other by a long time, even years. Wet changes occur unpredictably; they may even develop in AMD that started as the dry type, or they may recur in previously treated wet AMD. It is possible, even with no laser treatment, for the degenerative process to stop before very much vision has been lost. But it is more likely that central vision will continue decreasing, probably to the point that reading is hampered and driving a car is no longer safe.

If vision in both eyes drops to a level that eyeglasses cannot improve to better than 20/200 (the "big E" on the eye chart), the term "legal blindness" is used. But don't let that frighten you. This is merely a legal definition used to determine eligibility for certain social services (and an extra income tax exemption). Remember, even if the degeneration is severe, side vision will remain normal. You should continue to see well enough to move about comfortably and care for yourself. Some patients even surprise everyone by being able to see and pick up small objects from the floor.

What You Can Do

In addition to having regular eye exams, there is an easy and important test you can do yourself. Take a few seconds every day to check your vision with an Amsler grid, a card printed with a pattern of crossing lines that form small squares. Test each eye separately, with the other eye covered. The lines should look straight and solid. If any lines suddenly start looking wavy or having missing segments, that could indicate the beginning of wet changes that might be treatable, and you should make an appointment right away, to have your eyes examined within the next few days.

It is frightening to face the prospect of losing central vision. But there are ways to use your remaining sight to best advantage. Most people quickly learn how to use their peripheral vision more effectively, such as by learning to look slightly off-center. A low vision specialist can be a great help. This professional can work with you to select magnification devices for seeing better in specific situations. He or she will also introduce you to non-optical aids, such as large-type books and magazines, large press-on numbers for your appliances, and even talking clocks.

Consider joining a support group. You may find it comforting to talk to others who share similar problems and exchange ideas with them. If your problem seems especially overwhelming, you may wish to seek professional psychological support.

Always keep in mind that using your eyes will never harm them. You can continue any of your usual activities as long as you feel comfortable doing them. Even with reduced vision, your life can be surprisingly normal and fulfilling.

For up-to-date, reliable information, two nonprofit organizations invite you to contact them: Research to Prevent Blindness (645 Madison Ave., 21st floor, New York, NY 10022; 1-800-621-0026; fax 212-688-6231; e-mail info@rpbusa.org) can provide the latest research results, and The Foundation Fighting

Blindness, offers information, a newsletter, and location of support groups (Executive Plaza 1, 11350 McCormick Rd., Suite 800, Hunt Valley, MD 21031; 1-800-683-5555; TDD 1-800-683-5551).