

Age Related Macular Degeneration (ARMD): Part I A serious problem of the aging eye

by Louis J. Catania, O.D., F.A.A.O. and Ernst Nicolitz, M.D., F.A.C.S.

Summary: One of the greatest risks to the aging eye, especially in people over 65, is the condition called "age related macular degeneration" or ARMD. Not enough is known yet about this sight threatening condition to allow us to prevent it or cure it. But extensive research is being conducted with significant advances in its diagnosis and management. This discussion will help senior citizens better understand ARMD and the hopes for its prevention and cure in the future.

Over the past few months, our columns have discussed conditions of the aging eye for which multiple corrections, options and even cures are available including eye glasses, surgery, lens implants and so on. Those conditions are easier to address than some others that can occur during aging as well. These others we speak of are not quite as easily dealt with nor correctable with eyeglasses or even medicines or surgery. Among such uncorrectable conditions, a retinal degeneration called "age related macular degeneration" or ARMD as it is referred to, is the leading risk to the aging eye, especially in people over 65.

Let's first try to understand the basic problem of degeneration and then how it affects the eye. Degeneration is a kind of "breaking down" process that occurs in varying degrees throughout our bodies during aging. If and when degeneration occurs in the delicate nerve tissues of the eye which are critical to vision, it can adversely affect vision in an irreversible way. You must understand that nerve tissue can not regenerate nor easily be repaired or replaced once destroyed. Thus, degeneration of the retina (the nerve layer inside the eye -see illustration) would be irreversible and if that degeneration occurred at the critical point for central (straight-ahead) vision on retina called the macula, central vision would be permanently lost. This condition is called "age related macular degeneration" or ARMD and the exact reasons as to why such degeneration would occur right at the macula is not entirely known, although research is helping us begin to understand.

It is important to note that in the description of the irreversible loss of vision associated with ARMD, we keep referencing loss of central (straight-ahead) vision. The macula of the retina is responsible for only our central vision, needless to say also our most important portion of vision. But it is the remaining retina, generally not affected by age related degeneration that provides peripheral or side vision. Thus, the loss of vision associated with ARMD does not produce "total blindness." Though the person will find difficulty in seeing print or objects viewed directly, there is some consolation in the fact that the full retention of peripheral (side) vision and the ability to continue to physically move about quite comfortable in almost any surroundings (home, outdoors, etc.) is retained in ARMD.

The fact that this relatively frequent, visually threatening degeneration of aging attacks the very small area of the macula on the retina is an unfortunate and puzzling problem. Many potential causes and risk factors have been identified through ongoing research efforts. We now know that the following factors increase a person's risk for ARMD:

- A history of ARMD in other family members;
- Fair skinned individuals;
- Blue eyes;
- Lifelong exposure to ultraviolet radiation (sunlight without sunglasses);
- Cigarette smoking;
- Nutritional factors and vitamin and mineral deficiencies; and
- High blood pressure.

There are two forms of ARMD, the "dry form" and the "wet form." The dry form is so named because there is no fluid or blood leakage from vessels in the macula area, thus less visual disturbance occurs. Everyone with ARMD initially will have the dry form and, with proper care and prevention 90% will never progress beyond it. Thus, it is imperative for older people to identify the earliest changes in their vision to diagnose dry ARMD early and take proper measures to prevent progression. Besides regular eye examinations, once dry ARMD is diagnosed, checking your central vision regularly with a grid pattern of lines (graph paper with a center spot) called an Amsler Grid will help monitor any changes.

The way to use an Amsler Grid is to hold it at normal reading distance with your reading glasses on and cover one eye at a time. By looking ONLY at the center spot, the surrounding lines should appear straight and complete. Any distortions or changes in the surrounding lines should be reported to your eye doctor immediately.

The wet form of ARMD is much more disabling and difficult to manage than the dry form. This is the form that usually leads to significant and permanent loss of central vision. So what else besides good professional care and self monitoring with an Amsler Grid can a person with dry ARMD do to minimize the risk of progression onto the wet form? Obviously, they must actively reduce any of the controllable risk factors we listed above. That includes utilizing ultraviolet protection through tints in their regular eye glasses and sunglasses whenever outdoors. Also, optimizing their health habits by not smoking cigarettes (or anything for that matter); proper diet (we will discuss vitamins and mineral supplements in next week's column); and anything possible (like weight control, exercise, stress reduction, etc.) to reduce high blood pressure and other cardiovascular risk factors.

In the next column we'll discuss more about the wet form of ARMD and more so, all the new approaches evolving to help people with both forms of this unpleasant vision problem of aging.

Age Related Macular Degeneration (ARMD): Part II Treatment, Management and Research Efforts

by Louis J. Catania, O.D., F.A.A.O. and Ernst Nicolitz, M.D., F.A.C.S.

Summary: Although there is yet no prevention or cure for age related macular degeneration (ARMD), extensive research is being done to conquer this serious problem of aging. Controlling risk factors seems to be a valuable means of reducing the problem. Also, new laser and investigational surgical procedures are beginning to show some promise. This discussion describes some of these efforts to deal with ARMD.

In last week's column we discussed two forms of age related macular degeneration (ARMD), the "dry form" representing 90% of all ARMD and the more disabling and difficult to manage "wet form." We discussed ways for people to recognize the early signs of ARMD with an Amsler Grid and through changes in their vision. And we also talked about prevention and control of ARMD through reducing "risk factors" associated with its development and its progression from the dry form to the wet form.

This week we want to focus our discussion on existing and developing methods of treating the dry and wet form of ARMD. As with degeneration in general, there is no cure for the problem itself or for the damaging effects it produces. Thus, our goal in any form of treatment for degenerations like ARMD is to arrest its progress and terminate any further negative effects it may produce. Of course, such a philosophy of care means the earlier the patient identifies the problem and seeks care, the sooner any further ill effects can "hopefully" be stopped.

The more advanced forms of dry ARMD can cause loss of central vision and thus, even this form of ARMD should be treated to slow or arrest its progression. All patients with any degree of dry ARMD must

attempt to reduce all risk factors (see listing and discussion in last weeks -10/28/02 column). Also, they should have ultraviolet (UV) protective coatings on their spectacle lenses and should wear sunglasses for all outdoor activities. Increasing scientific data is also proving that daily multivitamins can slow the progression of high-risk dry ARMD. There are now special ophthalmic vitamin supplements available with optimal amounts of certain antioxidants that are most beneficial to the macula, like lutein and zinc.

Beyond controlling risk factors, UV protection and antioxidant supplements, advanced dry ARMD is now also being treated with specialized lasers to control its progression. The benefits of such laser treatments have shown positive results in limited studies, but more long term information and data over the coming years will be needed to confirm their true value.

When wet ARMD is diagnosed, besides the preventive measure we discussed for dry ARMD, there are some ways in which retinal specialists attempt to protect the macular from further damage. In wet ARMD, fluids leaking from abnormal and weak blood vessels build up in the macular area. Certain laser treatments are utilized to shrink these abnormal blood vessels to reduce further fluid build-up.

Another laser treatment for wet ARMD recently approved by the US FDA called "Photodynamic Therapy" uses an intravenous dye (Visudyne) which circulates into the abnormal macula blood vessels and is subsequently activated with infrared light. This treatment method seems to effectively eliminate the leaking blood vessels, but regrowth is also a risk and additional treatments may be necessary.

Retinal specialists are also utilizing some surgical procedures to treat wet ARMD. One procedure attempts to remove the abnormal blood vessels from the macular area with the hope of restoring macula vision (central vision) over a 6 to 12 month period. Again, there is significant potential for regrowth of vessels and the need for additional surgery. Another recently developed surgical procedure with a goal of restoring central vision is called "Limited Macular Translocation." This very complex procedure attempts, as its name implies, to relocate the macula to an area of retina with healthier blood vessels. This is still considered an investigational surgical procedure and it will be a few years before we know if it may have clinical benefits to wet ARMD patients.

One form of treatment for wet ARMD as well as other causes of loss of central vision is a science called "low vision rehabilitation." This clinical science utilizes specialized ophthalmic lenses which can serve to provide significant magnification of print and distance objects in our central vision. With this magnification effect, the disabling central blind spot becomes only a small portion of the overall field of vision no longer obscuring the object or print being viewed. This magnification effect can be achieved with specialized telescopic (for distance) and microscopic (for near) lenses, as well as special lighting techniques, large print reading materials and closed-circuit television magnifying systems.

All of the above mentioned procedures and treatments for both dry and wet ARMD are only the beginning to our assault on this unfortunate aging process of certain eyes. Advancing studies investigating both the causes and most effective treatment methods for ARMD are among the highest priorities in eye care research. New medications, transplantation procedures, lasers, stem cell technologies and genetic therapies are all part of future prevention, treatment and cures for ARMD. But today, an understanding of your risks and conscientious attempts to control and reduce such risks remain the most important and valuable protection against this serious problem of the aging eye.