

Nutritional Supplementation for Age-Related Macular Degeneration

Age-related macular degeneration (AMD) is an acquired ocular disorder and a leading cause of legal blindness in persons over age 60. ⁽¹⁾ AMD affects the macula, the central part of the retina that is responsible for providing clear, sharp vision needed for reading, writing, driving and other daily activities.

The nature and severity of this condition vary with individual patients. Approximately 90 percent of patients with AMD have the non-exudative form of the disease, which results in the development of dry atrophic scars of the macular area. These patients generally experience a gradual loss of central vision. Only 10 percent of patients with AMD will develop the exudative form which results in the leaking of fluid beneath the retina and a greater and more rapid loss of vision. Effective laser photocoagulation treatment for the disease is limited to small numbers of patients with exudative AMD who are identified early. ⁽²⁾

Some research now suggests that the development of AMD may be the result of free radical oxidative damage to the retina due to antioxidant enzyme depletion. Therefore, antioxidant nutritional supplementation (e.g., vitamins C, E, beta-carotene and zinc) may help to prevent or impede the progression of AMD. It is theorized that antioxidants may function as defense mechanisms that convert free radicals (highly reactive by-products of cellular metabolism) into stable compounds before they interact with cell membranes to produce damage. ⁽³⁾ The results of animal studies have supported this theory. ⁽⁴⁻⁶⁾

However, several human clinical studies have had inconclusive results. ⁽⁷⁻⁹⁾ One study did suggest that a higher dietary intake of carotenoids, especially those obtained from dark green leafy vegetables (e.g., spinach and collard greens), was associated with a significantly lower risk for AMD. ⁽¹⁰⁾ An 18-month study of individuals with advanced AMD found that a twice-a-day use of antioxidant supplements did not improve vision, but did keep it from getting worse. ^(11, 12)

The use of antioxidants cannot reverse the damage caused by AMD; however, they may be able to prevent or slow its progression in some patients. If dietary supplementation of antioxidants is undertaken as a preventive measure, its use may be most appropriate for the following individuals:

Over age 50

Family history of AMD

Insufficient dietary intake of vitamins and minerals

These preliminary findings are indeed hopeful, but more data is needed to define nutritional and antioxidant therapies for the prevention of AMD. Until these study results are available, the American Optometric Association recommends patients stop smoking, consume a nutritionally balanced diet and regularly see their optometrist for early detection of AMD.

References

1. Prevent Blindness America. Vision problems in the U.S. Schaumburg, IL: Prevent Blindness America, 1994.

2. Cavallerano AA, Cummings JP, Freeman PB, et al. Optometric clinical practice guideline on care of the patient with age-related macular degeneration. St. Louis: American Optometric Association, 1994.
3. Van Der Hagen AM, Yolton DP, Kaminski MS, Yolton RL. Free radicals and antioxidant supplementation: a review of their roles in age-related macular degeneration. *J Amer Optom Assoc* 1993; 64:871-8.
4. Hayes KC. Retinal degeneration in monkeys induced by deficiencies of vitamin E or A. *Invest Ophthalmol* 1974; 13:499-510.
5. Ham WT, Mueller HA, Ruffolo JJ, et al. Basic mechanisms underlying the production of photochemical lesions in the mammalian retina. *Curr Eye Res* 1984; 3:165-74.
6. Organisciak DT, Wang HM, Li Z, Tso MO. The protective effect of ascorbate in retinal light damage of rats. *Invest Ophthalmol* 1985; 26:1580-8.
7. Newsome DA, Swartz M, Leone NC, et al. Oral zinc in macular degeneration. *Arch Ophthalmol* 1988; 106:192-8.
8. The Eye Disease Case-Control Study Group. Antioxidant status and neovascular age-related macular degeneration. *Arch Ophthalmol* 1993; 111:104-9.
9. West S, Vitale S, Hallfrisch J, et al. Are antioxidants or supplements protective for age-related macular degeneration? *Arch Ophthalmol* 1994; 112:222-7.
10. Seddon JM, Ajani UA, Sperduto RD, et al. Dietary carotenoids, vitamins A, C and E and advanced age-related macular degeneration. *JAMA* 1994; 272:1413-20.
11. Age-related Macular Degeneration Study Group. Multicenter ophthalmic and nutritional age-related macular degeneration study - part 1: design, subjects and procedures. *J Amer Optom Assoc* 1996; 67:12-29.
12. Age-related Macular Degeneration Study Group. Multicenter ophthalmic and nutritional age-related macular degeneration study - part 2: antioxidant intervention and conclusions. *J Amer Optom Assoc* 1996; 67:30-49.

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