

## Macular degeneration

Age-related macular degeneration (AMD) is the leading cause of blindness and visual impairment in people over the age of 50 years. It is a chronic painless eye disease associated with ageing that causes blurred vision and loss of central vision, but not complete blindness.

Approximately 1 in 7 Australians over 50 have some evidence of AMD. Population-based studies suggest that approximately 1 in 3 people over 80 have early signs of the disease and 1 in 8 people have late-stage disease.

Smoking cessation has the most profound effect on risk reduction because smoking doubles the risk for progression of AMD. Smokers get macular degeneration 5 to 10 years earlier, on average. After quitting smoking, one's risk for AMD appears to return to the baseline population risk after 20 years.

### Types of AMD

Age-related macular degeneration is classified into 2 types:

- Dry
- Wet or neovascular

Dry AMD is the more common and less severe form but is often a precursor to wet AMD. Although 80% of patients with AMD have the dry form, the wet form is responsible for 90% of severe loss of vision associated with AMD. Wet AMD tends to cause more severe vision loss than dry AMD.

Dry AMD occurs due to breakdown or thinning of the macula, gradually producing loss of central vision. Dry AMD usually begins when tiny, yellow deposits called drusen form under the retina. In wet AMD, the formation of leaky blood vessels under retina produces rapid loss of central vision.

### Stages of AMD

AMD can also be divided by severity of disease into early, intermediate, and advanced AMD.

Early AMD, affecting 12% of people over 50 years, usually has no symptoms. Advanced AMD affects 2% of people over 50 rising to over 14% of people over 80.

### Risk factors

Risk factors for AMD include:

- Family history, particularly if the affected family member is aged under 50 years
- Smoking
- Being aged 75 years or over

### Symptoms of AMD

In its earlier stages, AMD does not cause any symptoms. In the later stages of AMD, symptoms depend on the type and severity of the condition. Common symptoms of AMD may include:

- Problems with close work such as reading
- Distorted central vision (for example, straight lines look wavy)
- Blurred central vision
- Blank or dark spots
- Complete loss of central vision

### Treatment

There is no cure for AMD but treatment aims to preserve vision for as long as possible.

Highly effective vascular endothelial growth factor inhibitors (anti-VEGF injections) available on the PBS for age-related macular degeneration. Anti-VEGF treatment improves vision in about one-third of people and stabilises progression in about 9 in 10 people. They are administered by intravitreal injection. A slight ache or pain in the eye can last a day or two after administration, and the eye may feel sore and gritty.

- brolucizumab (*Beovu*)
- ranibizumab (*Lucentis*)
- faricimab (*Vabysmo*)
- aflibercept (*Eylea*)

Early treatment produces best outcomes. Laser treatment may be recommended if the leaking blood vessels are located away from the centre of the macula. Gene therapy is a promising alternative to ongoing eye injections.

Diet, smoking cessation and lifestyle changes can also slow the progression of AMD. A Mediterranean diet, which includes a high proportion of fruits, vegetables, and fish, can lower risk of progression to late AMD and to large drusen.

## AREDS study

Ten years ago, the Age-Related Eye Disease Study (AREDS) was designed to examine the role of dietary supplements in AMD and cataracts. The study compared high-dose antioxidants and zinc to placebo to assess their role in reducing progression of eye diseases in older people.

The AREDS 2 trial found that certain vitamins and minerals can help people who have a lot of drusen. The formulation can reduce the risk of AMD progression by about 25%. In people with very early signs of AMD, who are at low risk of progression, this would mean that there would be approximately 4 fewer cases of progression to late AMD for every 1000 people taking vitamins. In people at high risk of progression (i.e., people with moderate AMD) this would correspond to approximately 8 fewer cases of progression for every 100 people taking vitamins.

The supplements may also lower the risk of wet AMD and vision loss in the second eye of people who have lost vision in one eye.

The formula used in the AREDS 2 trial included:

- Vitamin C 500mg
- Vitamin E 400IU
- Lutein 10mg
- Zeaxanthin 2mg
- Zinc oxide 80mg
- Copper (as cupric oxide) 2mg

*Macu-Vision Plus* contains these vitamins and minerals, but despite the label stating a dose of one daily, to match the AREDS 2 supplement used in trials, two tablets should be taken daily.

Other products are available, including:

- *Ocuvision 50 Plus* contains vitamin C 75mg, fish Omega-3 triglycerides 400mg, vitamin E 10mg, lutein 5mg, zinc gluconate (zinc 4.5mg)
- *Ocuvite 50+* contains Fish oil 452mg, Omega-3 fatty acids 250 mg, Lutein 6mg, Zeaxanthin 1mg, Vitamin C 150 mg, Vitamin E 20 mg, Zinc 9 mg, Copper 1mg

Supplements containing only lutein and zeaxanthin are heavily marketed for people with age-related macular degeneration; however, there is no evidence of effect on the progression of AMD. Vitamin E alone may have little or no effect on the progression to late AMD and vision loss.

It is important to note that nutritional supplements are not a cure for AMD but may slow the progression of intermediate AMD. For those persons without AMD or early AMD there is no evidence for benefit.

## Prevention

A number of observational studies have demonstrated a protective effect with increasing dietary intake of antioxidant vitamins. High dietary intake of beta carotene, vitamins C and E, and zinc is associated with a substantially reduced risk for AMD in older people. However, vitamin E, vitamin C, lutein, zeaxanthin or beta-carotene supplements will not prevent or delay the onset of AMD.

## Summary

Age-related macular degeneration is a common chronic disease among older people. It causes progressive loss of central vision. Antioxidant supplements are effective for slowing the progression of advanced or wet AMD. It is important that an adequate dose is administered. A Mediterranean diet can reduce the risk of AMD in people without AMD and people in early stages.

Further information is available at <http://www.mdfoundation.com.au/>

## References

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