2. Wet age-related macular degeneration

Age-related macular degeneration (ARMD) is the leading cause of severe vision loss in the Western world for those aged 50 years and older.\(^1\) It is associated with degenerative, oxidative, and inflammatory changes in the macular region of the retina, which can cause central visual loss. Age-related macular degeneration is categorized into 2 forms: a dry or nonneovascular form and a wet or neovascular form. The dry form is more common and accounts for the vast majority of ARMD cases. The wet form, however, is more debilitating, and is responsible for more than 80% of the visual loss in such patients.\(^1\) The prevalence of early ARMD increases from around 4% in those younger than 60 years to more than 30% in those aged 85 years and older.\(^2\) Known risk factors of ARMD include family history, increasing age, smoking, and white race. With an aging population, the prevalence and incidence for ARMD will increase and are predicted to pose an enormous challenge to the provision of eye care in Canada.\(^3\)

Age-related macular degeneration is believed to result primarily from dysfunction in the retinal pigment epithelium—a critical layer underneath the retina, which is multifunctional and responsible for retinal health. Dry ARMD, characterized by drusen on direct ophthalmoscopy, might convert to wet ARMD acutely or subacutely. Wet ARMD refers to the development of neovascularization within the neural retina from vessels originating from the choriocapillaris, a complex network of blood vessels underlying the retina and retinal pigment epithelium. The new choroidal vessels cause vascular leakage and hemorrhaging, resulting in devastating visual loss.\(^4\)

On ophthalmoscopy, wet ARMD is characterized by the presence of subretinal fluid, intraretinal hemorrhage within the macular region, and sometimes exudates (Figure 1). The other diagnoses in question were incorrect based on typical fundoscopy findings: Retinal detachment is diagnosed by an elevated translucent retina with no hemorrhage. Central retinal vein occlusion is characterized by the so-called blood-and-thunder picture, with cotton-wool spots, intraretinal hemorrhaging, and disc edema. A patient with diabetic retinopathy normally presents with microaneurysms, cotton-wool spots, and dot-blot hemorrhages throughout the retina.

Symptoms of wet ARMD include metamorphopsia, blurry vision, and central scotoma.\(^4\) On examination, vision can have decreased to 20/400 or worse. An Amsler grid (Figure 2) tests for macular function and can detect early changes from wet ARMD.

Management

Patients with moderate to advanced dry ARMD can decrease their chance of progression to wet ARMD...
with various methods. Dietary modification, with increased green leafy vegetable intake, and smoking cessation are important evidence-based lifestyle changes. Furthermore, supplementation with a multivitamin that combines high-dose vitamins C and E, 

**Figure 1.** Subretinal fluid, intraretinal hemorrhage within the macular region, drusen, and exudates consistent with wet age-related macular degeneration.

**Figure 2.** Amsler grid: the patient is asked to focus on the central dot and report whether any of the lines appear wavy, and whether any areas of the grid appear to be missing. This is useful in identifying ARMD and as a home test for monitoring changes.
of hypertension (4.33% to 16.77%), myocardial infarction (1.44% to 1.89%), and stroke or cerebral infarction (0.72% to 1.89%). Indeed, the manufacturer of ranibizumab has released statements warning of the potential increased risk of stroke with intravitreal injection.

The safety profile of intravitreal bevacizumab is not as well known. When given intravenously for colon cancer, bevacizumab has been shown to induce serious systemic problems, such as hypertension, bleeding, and thromboembolic events. Although it has been demonstrated that bevacizumab is detectable in serum after injection into the eye, the peak serum levels achieved are minuscule relative to the level attained during intravenous administration. Nevertheless, patients are theoretically at risk of the aforementioned adverse events documented with intravenous bevacizumab.

**Recommendations**

Patients with dry ARMD can benefit from a variety of lifestyle and nutritional measures to help prevent visual loss. Such patients should be encouraged to use an Amsler grid at home. Conversion to wet ARMD can manifest as acute visual loss with metamorphopsia or central scotoma. These patients should be referred to an ophthalmologist immediately for consideration of treatment with anti-VEGF agents.

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**Competing interests**

None declared

**References**


