

Defining the Prevalence of AMD and Investigating Racial Differences

Prevalence rates and racial differences in AMD can help guide the development of screening and treatment policies.

REVIEWED BY SUSAN B. BRESSLER, MD

Age-related macular degeneration (AMD) is exceptionally common, currently affecting about 8 million Americans aged ≥ 55 , and it impacts people of all racial backgrounds, according to Susan B. Bressler, MD.¹

"The prevalence of late AMD will approximately double in the next 15 years. We look at the overall prevalence rates as well as differences between racial groups to help guide us in developing screening and treatment policies, and to potentially provide insights in terms of protective and causative factors," Dr. Bressler said in Las Vegas at Retina 2006: Emerging New Concepts, held in conjunction with the American Academy of Ophthalmology annual meeting. She is the Julia G. Levy PhD, Professor of Ophthalmology, at the Wilmer Eye Institute, Johns Hopkins University School of Medicine.

To define the prevalence of a disease, we count the number of cases of a disease present in a population at a specified time and divide that by the number of people in the population at that time, she explained. To report the prevalence of any AMD, for example, the numerator would include people with drusen that were at least medium in size ($>63 \mu\text{m}$), pigment abnormalities, geographic atrophy (GA), or choroidal neovascularization (CNV).

Alternatively, investigators can speak about the prevalence of specific AMD features, such as the prevalence of drusen that are at least medium in size.

EXPLORING THE PREVALENCE OF AMD

A number of investigators have explored the prevalence of AMD. The essential elements to accomplishing this are: Selection of an adult population-based cohort;

accumulation of color fundus photographs on as many participants as possible; grading images by an independent reading center that employs standardized image interpretation guidelines to generate the data; analysis of the data; and sorting individuals with select features of the disease into categories, such as early and late AMD.

Dr. Bressler said a variety of studies have been performed in many countries on various racial groups. "There are some important differences among these studies, however, that might contribute to differences in their outcomes. Such variation in studies include the age range of participants, heterogeneity of the racial mix of the cohort, mydriatic versus nonmydriatic camera use, unilateral versus bilateral image acquisition, image magnification, the actual definitions applied to identify specific AMD features, and how the features are grouped together to define levels such as early or late AMD."

The studies to date include a limited number of older participants, Dr. Bressler warned, and they also have a relatively limited number of AMD cases identified, particularly late AMD. "This means that the prevalence estimates provided may actually be unstable. So pooling the data from several large population studies may actually provide us with more accurate estimates," she said.

EYE DISEASES PREVALENCE STUDY

The Eye Diseases Prevalence Study compiled seven large population-based studies from the United States, Australia, and Europe (see sidebar Eye Diseases Prevalence Study). The total number of participants

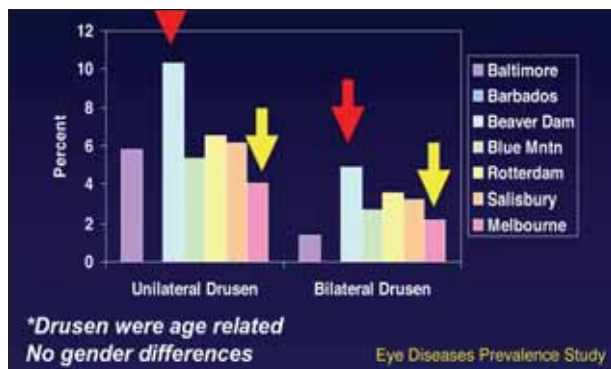


Figure 1. Data from the Eye Diseases Prevalence Study: Prevalence of large drusen $\geq 125 \mu\text{m}$. The drusen were age related and there were no gender differences.

varied among the pooled studies, from 2,400 to 6,800; as did the proportion of black participants, from 0% to 50%; and the minimum age of participants, from 40 to 65 years of age.

The prevalence of large drusen, defined as the presence of at least one druse in at least one eye that is ≥ 125 microns within 2 disc diameters of the foveal center, is an important AMD marker and one that requires intervention in the form of micronutrient supplements, Dr. Bressler said.

“The highest prevalence rates of large drusen was found in the Beaver Dam Study—10% for unilateral large drusen and 5% for bilateral large drusen. In contrast, in the Melbourne study we have much lower prevalence of 4% and 2% respectively (Figure 1),” she said.

Drusen are strongly age related in all populations without any gender differences.

With regard to the prevalence of late AMD, the Eye Diseases Prevalence Study looked at GA—a well-

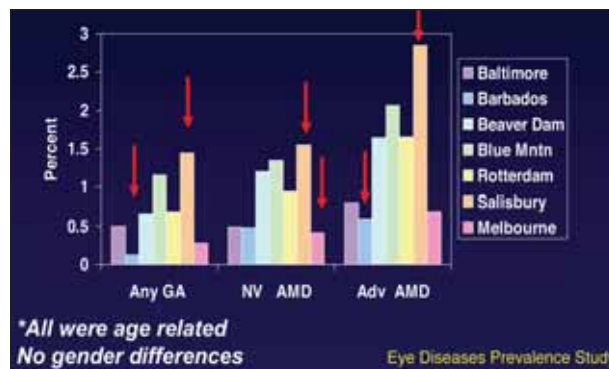


Figure 2. Prevalence of late AMD, according to the Eye Diseases Prevalence Study.

defined depigmented area of retinal pigment epithelium within 2 disc diameters of the fovea, not necessarily in the center. “We see the lowest prevalence of GA is in Barbados, at 0.1%; and the highest is in the Salisbury Eye Evaluation at 1.4% (Figure 2),” Dr. Bressler said. The Barbados cohort was entirely black and Salisbury included the oldest cohort studied to date, with an average of 74 years.

The Eye Diseases Prevalence Study took age-, race-, and gender-specific prevalence estimates and applied that to information from the 2000 US census including adults aged ≥ 40 years. This provides the overall rate estimates, Dr. Bressler said. The estimates are as follows: large drusen are expected in at least one eye of 6% of Americans, totaling 7.3 million people; any geographic atrophy is expected in 0.8% of the population or another 1 million people; CNV is expected in 1% of adults or about 1.2 million people.

“If we combine the two forms of advanced AMD, then we can estimate that 1.5% of our population, or 2.1 million people are affected,” Dr. Bressler said. “Note the marked association between prevalence and age for advanced AMD, with 1.1 million people aged ≥ 80 years having advanced AMD. In the year 2000 almost 2 million were estimated to have late AMD, and this number is expected to rise sharply to 3 million over the next 15 years as our population ages.”

RACIAL DIFFERENCES

Generally speaking, AMD prevalence is higher in white participants than in black participants, especially at the upper end of the age spectrum, and most importantly in the more advanced phases of the disease, Dr. Bressler said (Table 1). In the Salisbury study, in which a quarter of the participants were black, whites were much more likely than blacks to have:

- medium or large drusen;
- confluent drusen;

EYE DISEASES PREVALENCE STUDY

- Baltimore Eye Survey (Baltimore)
- Barbados Eye Study (Barbados, West Indies)
- Beaver Dam Eye Study (Beaver Dam, Wisc)
- Blue Mountains Eye Study (Sydney)
- Rotterdam Study (Rotterdam, Netherlands)
- Salisbury Eye Evaluation Study (Salisbury, Md)
- Visual Impairment Project (Melbourne, Australia)

Estimated Prevalence in US Population (Women only)				
	Drusen $\geq 125\mu\text{m}$		CNV	
	White	Black	White	Black
Age				
60-64	5.4	5.9	0.3	0.7
70-74	11.2	8.2	1.1	1.1
≥ 80	29.2	13.7	11.1	1.8

Table 1. Racial differences in AMD: Whites versus blacks.

- larger drusen area;
- focal hyperpigmentation;
- geographic atrophy; and
- CNV.

Dr. Bressler added that the racial differences for non-neovascular manifestations were most pronounced within 1 disc diameter of the foveal center.

Recent studies have explored AMD prevalence rates in Hispanics and there have been some conflicting data. The National Health and Nutrition Examination Survey III and the Colorado-Wisconsin Study have each identified relatively lower prevalence rates of late AMD in Hispanic patients compared with whites (Table 2).

"When looking at early AMD in the Colorado study, where 800 adults of Mexican ancestry are compared with 4,000 whites from Beaver Dam, you see equivalent prevalence rates. This is somewhat contradictory," Dr. Bressler said. "This was also found in the Los Angeles Latino Eye

NHANES III	Colorado-Wisconsin Study
Late AMD	Late AMD
.5% Whites	.6% Whites
.13% Blacks	.1% Hispanics
.06% Hispanics	OR: .07 (CI: .01 - .49)

Table 2. Racial differences in AMD: Whites versus Hispanics.

Study, which is the largest population of Hispanic people studied (6,000). If you look at rates of large drusen (14%), early AMD (10%), and late AMD (0.5%), these rates are comparable to population information performed in white cohorts."

If these prevalence rates are applied to the number of Latinos in our country, that would amount to 860,000 with early AMD, and about 50,000 with advanced AMD in one eye.

Dr. Bressler said that application of prevalence rates to the present and projected US census data provides estimates of the numbers of the US population that have AMD now and in the foreseeable future. This can help the appropriate agencies develop screening and treatment policies. ■

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1. Bressler SB. Prevalence and racial differences in age-related macular degeneration. Presented at Retina 2006: Emerging New Concepts. Held in conjunction with the American Academy of Ophthalmology annual meeting. Nov. 10-11, 2006. Las Vegas.

AMD PREVALENCE IN GREECE COMPARABLE TO OTHER WHITE POPULATIONS

REVIEWED BY FOTIS TOPOUZIS, MD

The prevalence of age-related macular degeneration (AMD) in Greece was found to be comparable to that in other white populations, according to a report in the *American Journal of Ophthalmology*.¹

"A dramatic increase in prevalence in people older than 80 years of age was observed. The large majority of those with AMD were unaware of the diagnosis," wrote Fotis Topouzis, MD, and colleagues, from the II Department of Ophthalmology, Aristotle University of Thessaloniki, Thessaloniki, Greece.

Dr. Topouzis and colleagues conducted a cross-sectional population-based study to estimate the age- and gender-specific prevalence of AMD in a sample of people aged ≥ 60 years in Thessaloniki. A total of 2,554 randomly identified people underwent a complete ophthalmologic exami-

nation. The prevalence was 2.5% for AMD, 1.4% for neovascular AMD, and 1.3% for geographic atrophy. The investigators found that bilateral AMD was present in 40% of AMD cases. AMD, neovascular AMD, geographic atrophy, and bilateral AMD increased with increasing age ($P < .0001$).

The investigators reported that no gender-specific statistically significant differences were noted. Of all participants with AMD, 67% were unaware of the diagnosis, they added. ■

Fotis Topouzis, MD, is from the II Department of Ophthalmology, Aristotle University of Thessaloniki in Thessaloniki, Greece. He may be reached at ftopouzis@otenet.gr.

1. Topouzis F, Coleman A, Harris A, et al. Prevalence of age-related macular degeneration in Greece: The Thessaloniki Eye Study. *Am J Ophthalmol*. 2006;142:1076-1079.