

Does Race Matter

Considering this factor promotes the more effective treatment of patients.

BY ALAN L. ROBIN, MD



Classifying individuals according to race is difficult, because there may be no genetic basis for phenotypic attributes such as skin color and body habitus. There is no black, Hispanic, or white gene. Ethnicity likewise deals with cultural and learned behavioral attributes, and the line between race and ethnicity

is often indistinct. For this discussion, I will use the term *race* to represent what individuals claim to be when asked on the US census as well as on ophthalmic prevalence and treatment studies. A physician's primary duties are to identify individuals at greatest risk of developing a disease and treat them in an effective and a cost-efficient manner. Because race, by the earlier definition, appears to be related to the prevalence, physical characteristics, and treatment of glaucoma, it is germane to physicians' daily care of glaucoma patients.

EVALUATING RISK FACTORS

Epidemiology

Each individual has a unique set of risk factors based on genetics, environment, and culture. An awareness of risk factors assists physicians in detecting and preventing disease, developing screening strategies, and counseling patients.

From an epidemiologic perspective, there are some marked differences in the prevalence of glaucoma among races. For example, studies have reported the prevalence of the disease among white northern Europeans aged 75 to 79 years at between 1.1% (Rotterdam)¹ and 6.4% (Australian Blue Mountains).² These figures differ vastly from those reported for predominantly African-derived populations, for whom the prevalence of glaucoma in the same age group ranges from 5.1% in Tanzania³ to 17.5% in Barbados.⁴ Does this difference hold up in Baltimore, however? Yes, in the Baltimore Eye Survey,⁵ the prevalence of glaucoma in the same age groups varied from 9% in blacks to 1.7% in whites. When defined by patients, race constituted a real difference in the prevalence of glaucoma. In essence, this study found an age-adjusted prevalence of glaucoma that was 6.5 times higher in blacks than whites. Glaucoma

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screenings would therefore be better targeted at primarily black versus mainly white communities.

Also noteworthy is that the prevalence of glaucoma among Hispanics in the southwestern US is similar to that of whites in Baltimore until the age of 65, at which point open-angle glaucoma is as common in Hispanics as in older black patients, if not more so.⁶ Likewise, the prevalence of glaucoma in Latinos aged between 70 and 79 years was 14.7%, seemingly much higher than in other racial groups.⁷

Anatomy

Certain anatomic markers may facilitate glaucoma diagnosis and treatment. Because two studies found that blacks have larger optic discs than whites, practitioners should realize that a large cup in a black patient may not be pathologic and in need of treatment.^{8,9} (This anatomic finding may or may not imply that the lamina cribrosa is structurally different and more susceptible to injury at comparable IOPs.)

In their unilateral analysis of the Ocular Hypertension Treatment Study, Zangwill et al¹⁰ also found that thinner corneas and larger disk sizes—both risk factors for developing glaucoma—were more common in black than white subjects. Additionally, Herndon et al¹¹ found that glaucoma may progress quicker in patients with thinner corneas.

Biology

The Advanced Glaucoma Intervention Study (AGIS) is an NEI-sponsored, multicenter study that has attempted to enroll a proportionate number of black compared with white recruits. Investigators identified differences in blacks' and whites' responses to therapy. On maximum medication,

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in Glaucoma?

This factor is mutable and therefore not important.

BY EVE J. HIGGINBOTHAM, MD



Recently, the investigators of the Ocular Hypertension Treatment Study¹ published their findings regarding the outcome of those self-identified African Americans enrolled in the study who developed glaucoma. Of course, the primary finding of the study was the determination that topical medication

delays or prevents the onset of primary open-angle glaucoma among individuals with ocular hypertension.

Interestingly, there was a higher rate of conversion in this cohort than described in the previous outcome report published in 2002.² Among untreated African Americans, the conversion rate to glaucoma was 16.1% versus 8.4% in those individuals who received treatment.¹ When contrasting these numbers with the conversion rates for the overall group (9.5% untreated vs 4.4% treated), one might at first conclude that race matters. Closer inspection of the risk factors and multivariate analyses of the data, however, reveals that race failed to reach a level of statistical significance. Many of the African Americans in this cohort had significant risk factors such as thin corneal measurements and high cup-to-disc ratios, and these factors apparently accounted for the higher rates of conversion noted. I would argue that race does not matter in glaucoma.

A TERM IN QUESTION

Is it surprising that race was not a statistically significant factor in the recent report from the Ocular Hypertension Treatment Study? Not really, particularly when one considers that the term *race* is born of social and political constructs. For at least the last 10 years, many geneticists, evolutionary biologists, and anthropologists have abandoned the notion that there is a biological basis for racial classification.³ Because the human genome project has determined that the human race derives from a single genetic source and that human beings share 99.9% of their genes, it is apparent that classifying the human population into three, four, and perhaps even eight groups was purely arbitrary.⁴

The significant genetic admixture that has occurred over the last 200,000 years at minimum means that there is no

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true separation among populations (at least as regards classification that can be reduced to the single digits). Nineteenth-century naturalists such as Samuel Morton and Louis Agassiz used faulty methods of investigation to support preconceived hypotheses.⁵ Questions regarding this issue of race are slowly permeating the public consciousness, as evidenced by the findings of the 2000 US Census, in which 800,000 individuals identified themselves as both African American and Caucasian.⁶ How credible is a classification that is based on invalid and mutable information?

WHAT DOES MATTER?

If race is not important, then what is? Glaucoma is known to be heritable. In fact, having a first-degree relative with glaucoma has been estimated to increase an individual's risk of developing glaucoma at least sevenfold. Family history is based on the patient's own report, however, which is often not verified and is subject to the variable definition of glaucoma by the professional community. Nevertheless, family history is a better starting point for determining the influence of heritage than a broader term such as *race*.

In the absence of a known family history, ethnicity or at least place of origin may be considered as surrogates. Thus, the prevalence of open-angle glaucoma among Mexican Americans (recently reported to be 4.74%)⁷ is a helpful statistic for this particular ethnic group. Would it be relevant to the Mexicans who trace their origin to a different part of Mexico or South America, however? If the patient sitting in the exam lane was born in Barbados, knowing that the prevalence of open-angle glaucoma among islanders in Barbados is 6.6%⁸ is helpful, particularly if the patient does

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blacks who then underwent argon laser trabeculoplasty needed fewer second and third interventions than whites. By contrast, those blacks who received trabeculectomy required more second and third interventions than whites. Compared with whites, blacks in the argon laser trabeculoplasty-trabeculectomy-trabeculectomy group less often required cataract surgery but needed more medications to achieve an IOP of less than 18 mm Hg. Blacks in the trabeculectomy-first group had a more difficult time achieving IOP control, and had both more vision and visual field loss than whites. Travoprost, a prostaglandin analogue, lowers IOP 1.8 mm Hg more in black patients.^{12,13}

“Recognizing that [a] lack of access [to glaucoma treatment] appears to be related to race may permit the redress of inequalities in the healthcare delivery system.”

Social Differences

The AGIS investigators have reported many racial differences, some of which are social and may have potentially clinically significant implications. A patient's family members may assist the treatment of an asymptomatic disease such as glaucoma by helping to explain the disease process or reminding the patient to take medications. AGIS investigators found that 56% of black versus 34% of white subjects had never married, were widowed, or were divorced. With less familial support, black subjects may be less likely to comply with treatment and therefore may be more at risk of progressive glaucomatous damage. The study also determined that 51% of black versus 78% of white subjects had at least a high-school education. Educational level may affect patients' understanding of their disease, its significance, and its treatment as well as their comprehension of directions for taking medications and their compliance with therapy. Physicians might therefore wish to bear these statistics in mind, include marital status and educational level in the patient history, and simplify their discussions with certain individuals.

In blacks, glaucoma is the leading cause of blindness and visual disability. Moreover, blindness from the disease is 50% more common in black versus white nursing home residents.¹⁴ Nursing home residents also have a greater burden of unoperated glaucoma.¹⁵ The disease can begin 10 years earlier⁹ and progresses more rapidly in black versus white patients.^{16,17} In addition, studies have indicated that black patients underwent trabeculoplasty and trabeculectomy at 47% below the expected age/sex-adjusted

rate¹⁸ and that the undertreatment of black Medicare beneficiaries primarily involved limited access to eye care.¹⁹ Recognizing that this lack of access appears to be related to race may permit the redress of inequalities in the health-care delivery system. Physicians should attempt to increase black individuals' access to medical care.

CONCLUSION

Although so-called race is in no way a perfect means of distinguishing two different populations, it has some profound implications for general practice. For instance, it seems that screening efforts should be targeted at black communities, the members of which appear to be underserved. Moreover, race has helped to highlight an apparent disparity in the health care system that must be resolved. More succinctly, race can help practitioners to deliver better, more effective care to all. □

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not know his or her family history. Although *ethnicity* may be considered as imprecise a term as *race*, it is a better starting point when characterizing specific populations. Nonetheless, family history is a superior measure of an individual's genetic heritage.

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THE SPECIFICS

The Ocular Hypertension Treatment Study has provided clinicians with the means to break through the myth of race. Molecular geneticists have embarked on an international project entitled the “HapMap Project,” which seeks to consolidate approximately 10 million single nucleotide polymorphisms into a more manageable 500,000 blocks and possibly correlate these blocks with specific populations.⁹ Until a more refined method of determining genetic lineage becomes available, I believe it is important to measure specific biological findings in any given patient. A thin central cornea combined with a large cup-to-disc ratio appears to impart a higher risk of conversion to glaucoma, regardless of treatment.

Until practitioners can assess a patient's individual genetic profile, they must continue to ask about family history and, to the best of their ability, clarify that history with additional questions. Did your mother go blind before she died? Did she ever undergo a procedure on her eyes other than cataract surgery? Was she treated with eye drops? Race does not matter because it is a term that has no biological basis. □

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