About Genetics, Lifestyle and Age-Related Macular Degeneration

Michael Waisbourd MD and Anat Loewenstein MD
Department of Ophthalmology, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel
Affiliated to Sackler Faculty of Medicine, Tel Aviv University, Ramat Aviv, Israel

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Age-related macular degeneration is the leading cause of blindness and visual impairment in the developed world [1]. In their interesting work that appears in the current issue of IMAJ, Abu Asleh et al. [2] suggest that AMD is less common in Arabs compared with Jews in the city of Jerusalem. They compared the number of patients eligible for certification of blindness and the number of patients who underwent photodynamic therapy for neovascular AMD and provided additional convincing evidence that ethnic background plays an important role as a risk factor for advanced AMD. This finding coincides with other studies that describe wide variations in AMD prevalence among different ethnic groups, ranging from 1% in black Africans older than 65 years to 100% in 90 year olds in Finland [3]. The reasons for such huge differences may be both non-modifiable risk factors, such as genetic background, and modifiable ones such as differences in lifestyle.

Unfolding the genetics of AMD
Family history is a well-known risk factor for the development of AMD [4]. This fact motivated clinical and basic science research in order to uncover the underlying genetic factors influencing the disease. For instance, twin studies found that the concordance rate for AMD in monozygotic twins was almost double that of dizygotic twins [5]. Genetic studies identified the most important genetic factor to be the complement factor H (CFH) gene, a major inhibitor of the complement system [6]. A common coding variant of this gene significantly increases the risk for AMD and very likely explains approximately 43% of AMD in older adults [6,7]. Thus, the genetic factor alone may be the decisive factor in determining disease prevalence in any given ethnic group.

Diet and AMD
There is growing evidence that diet is a risk factor for AMD [8,9]. Several theories have suggested that the pathogenesis of AMD is multifactorial and may involve oxidative stress, angiogenesis, and inflammatory or immune responses, all of which may be influenced by diet.

A high dietary intake of anti-oxidative agents, such as beta carotene, vitamins C and E, and zinc, was associated with a substantially reduced risk of AMD in elderly persons living in a middle-class suburb of Rotterdam, The Netherlands [8]. An Australian study noted that the consumption of fish, which is rich in omega-3 fatty acids, may protect against AMD as well [9]. Dietary habits are inevitably related to ethnicity, with different social groups having different dietary preferences. While some groups may be accustomed to and prefer a healthier “AMD-protective” diet, others may choose to consume, or have no choice but to consume, less nutritious substances. Yuzawa et al. [10] reported that the number of exudative AMD patients was estimated to have almost doubled over the 6 year period since the initial survey in 1987. It is well known that there have been drastic changes from traditional Japanese to westernized diets over the years, and it is tempting to draw a parallel between these two phenomena.

Cigarettes, alcohol and AMD
Both cigarette smoking and alcohol consumption are modifiable risk factors for developing AMD. Evans and collaborators [11] speculated that smoking alone may be attributing to approximately 28,000 cases of the disease in the United Kingdom. Some studies suggested that certain alcoholic beverages are associated with up to a threefold risk for developing advanced AMD, but the issue is controversial [12]. In terms of their relation to ethnicity, both habits cross borders and ethnic lines, and certain subgroups are at greater risk than their ethnic brethren. For instance, smoking has been universally associated with poorer high school educational achievement, lower graduation rates, and limited professional aspirations [13]. Thus, a genetic advantage could be challenged by a disadvantaged lifestyle.

Obesity and other modifiable risk factors for developing AMD
The growing epidemic of obesity may be related to more than cardiovascular, endocrine and psychological morbidity: some reports have suggested that there may be an increased risk for progression to advanced AMD in individuals with larger waist circumferences and higher waist-hip ratios [14]. Moreover, physical activity may have a beneficial effect on the progression to advanced AMD [14], and obesity has strong social and environmental origins that may well be affected by ethnicity. Other environmental insults, such as serum cholesterol, hypertension, sunlight exposure, and many others were associated with AMD pathogenesis as well [15] and they, too, are linked to ethnic influences.
Different characteristics of AMD according to ethnic background

Not only does the prevalence of the disease differ among various ethnic groups, but several studies have revealed new variants of AMD that characterize specific populations. The Inuit population in east Greenland was shown to have a “Greenlandic type” of AMD in the form of retiectorchoroidal atrophy, which is characterized by peripapillary and central retinocchoroidal atrophy and sclerosis resembling a recumbent Russian matushka doll [16]. In a study conducted in Fukushima, Japan, neovascular AMD in Japanese patients had different demographic features than those reported for Caucasian patients: the Japanese had a preponderance of polypoidal choroidal vasculopathy, male gender, unilaterality, and absence of drusen in the second eye [17].

In conclusion, different ethnic groups can have significantly different genetic patterns and can vary considerably in their lifestyles in terms of diet, cigarette smoking, alcohol consumption, etc. All these may explain, in part, the differences in the prevalence of AMD between Jews and Arabs in Jerusalem, as presented by Abu Asleh et al. [2]. A population-based survey is required to further estimate the overall prevalence of AMD among these ethnic groups in Israel.

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References

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Correspondence: Dr M. Waisbourd, Dept. of Ophthalmology, Tel Aviv Sourasky Medical Center, 6 Weizmann Street, Tel Aviv 64239, Israel.

Phone: (972-3) 697-3408
Fax: (972-3) 697-3870
email: mwaisbourd@hotmail.com

Capsule

Probiotic Lactobacillus preparation to prevent diarrhoea

Hickson et al. tried to determine the efficacy of a probiotic drink containing Lactobacillus for the prevention of any diarrhea associated with antibiotic use and that caused by Clostridium difficile. Of 57 in the probiotic group 7 (12%) developed diarrhea associated with antibiotic use compared with 19/56 (34%) in the placebo group (P = 0.007). Logistic regression to control for other factors gave an odds ratio of 0.25 (95% confidence interval 0.07–0.85) for use of the probiotic, with low albumin and sodium also increasing the risk of diarrhea. The absolute risk reduction was 21.6% (6.6–36.6%), and the number needed to treat was 5 (3–15). No one in the probiotic group and 9/53 (17%) in the placebo group had diarrhea caused by C. difficile (P = 0.001). The absolute risk reduction was 17% (7–27%), and the number needed to treat was 6 (4–14). The authors conclude that consumption of a probiotic drink containing L. casei, L. bulgaricus, and S. thermophilus can reduce the incidence of antibiotic-associated diarrhea and C. difficile-associated diarrhea. This has the potential to decrease morbidity, health care costs, and mortality if used routinely in patients aged over 50.