'Nature' and 'nurture' variables early predictors of AMD

June 25 2009

Like many diseases, causes for age-related macular degeneration (AMD) can be categorized as either "nature" or "nurture". Researchers think these factors, when used in the proper model, can be strong predictors of the disease.

AMD is the leading cause of vision loss in Americans 60 years of age and older.

A study published in the Association for Research in Vision and Ophthalmology's peer-reviewed *Investigative Ophthalmolgy & Visual Science* ("Prediction Model for Prevalence and Incidence of Advanced Age-Related Macular Degeneration Based on Genetic, Demographic and Environmental Variables") shows that multiple genetic, ocular and environmental factors, including six genetic variants, age, smoking and body mass index heavily contribute to the incidence of AMD. Because all of these factors are related to AMD, they were combined and used to develop a predictive and possibly diagnostic model.

"The determinants of the model can be assessed by completing a questionnaire and taking a blood test, and it is a tool which could be used to help guide prevention and treatments" said lead author and principal investigator, Johanna M. Seddon, MD, ScM, Professor of Ophthalmology at Tufts University School of Medicine and Director of the Ophthalmic Epidemiology and Genetics Service at Tufts Medical Center. "Such information may be also be useful for screening those at high risk of AMD due to a positive family history or having signs of

early or intermediate disease even among those with normal vision," the study says.

Over 1,400 individuals in the Age-Related Eye Disease Study (AREDS) with an average follow-up time of 6.3 years were evaluated, and genetic specimens were genotyped in the collaborator's lab in Boston. Both prevalence and development of advanced dry and wet AMD over the course of the study were included in the analyses. Researchers found all tested variables to be independently associated with AMD. The predictive power of the variables in the formula was very high, and the probability that the risk score based on the group of factors in that model for a progressor was higher than the corresponding risk score for a random non-progressor within the same 10 year age group was 83%.

Their research also shows that although AMD has a strong genetic component, healthy behaviors can modify your genetic susceptibility. For example, among individuals with one genotype, the homozygous C3 risk genotype, the likelihood of progression to the advanced form of AMD increased from about three-fold for nonsmokers to nearly 10-fold for smokers.

"Our algorithm could help with the selection of study participants for treatment trials and could one day enable doctors to choose the most efficacious treatment for individual patients," Dr. Seddon said. "It also gives any older person concerned about AMD, or any patient with early stages or a family history of AMD, even more incentive to avoid risk factors such as smoking and excessive weight."

Source: Association for Research in Vision and Ophthalmology (news : web)