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Known genetic risk for Alzheimer's in whites also places blacks at risk

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A commonly recognized gene that places one at risk for Alzheimer's disease does not discriminate between blacks and whites, according to new research led by Florida State University.

FSU Psychology Professor Natalie Sachs-Ericsson and graduate student Kathryn Sawyer have found that the gene APOE epsilon 4 allele is a risk factor for African-Americans as well as whites. Until now, it has been a mainstream belief that the gene is only a risk factor for whites.

"The results of our study have clear implications for research and treatment of Alzheimer's disease," Sachs-Ericsson said. "The APOE test might be used as one tool in identifying people who are at risk for Alzheimer's. We now know that African- Americans and Caucasians alike need to be considered for such risk assessments."

Sachs-Ericsson and Sawyer collaborated with Kristopher Preacher of the University of Kansas and Dan Blazer of Duke University Medical Center on the study. The study has been published online in the journal *Gerontology*.

The researchers' findings underscore the importance of including both blacks and whites in future studies that explore why the APOE genotype is a risk factor for Alzheimer's disease, a progressive and fatal brain disease that causes problems with memory, thinking and behavior. By understanding the mechanism by which the genotype confers risk, scientists could potentially develop medicines that slow the progress of

Alzheimer's or even prevent it, according to Sachs-Ericsson.

Sachs-Ericsson's team theorized that small sample sizes coupled with possible racial bias in measuring cognitive functioning may explain why some studies have failed to detect the effect of the APOE epsilon 4 allele on cognitive decline among blacks.

In addition, false-positive rates for dementia on standardized screening tests are higher for blacks than for whites when compared to neurologists' ratings of cognitive status, Sachs-Ericsson said, and those false positives may have obscured the influence of the gene on dementia. Alzheimer's disease is the most common form of dementia.

Alleles are different variants of a gene. Everyone has the APOE gene, but what differs across people is which variant they happen to have: epsilon 2, epsilon 3 or epsilon 4. In addition, each person has two alleles of the gene -- one from the mother and one from the father. Having at least one APOE epsilon 4 allele is a risk factor for Alzheimer's, but not everyone who has it will develop the disease, Sachs-Ericsson said. And some people who develop Alzheimer's do not have the allele.

"While having the APOE epsilon 4 allele increases the risk of developing Alzheimer's disease, APOE genotype alone is not enough to predict the disease," she said. "We don't understand why the allele predicts Alzheimer's in some but not others. There may be other biological or genetic causes or even environmental factors, such as diet, that determine whether the allele will lead to Alzheimer's. We need a better understanding of what these factors are and whether they affect African Americans and Caucasians equally."

The researchers used data from the Duke Established Populations for Epidemiologic Studies of the Elderly. To determine genotype, DNA samples were collected through blood or cheek swabs from 2,076 people

65 or older.

In the study, participants were divided into two groups: those who had at least one APOE epsilon 4 allele and those who had no epsilon 4 allele. Cognitive errors on a standardized test were measured in four in-person interviews over a 10-year period ending in 1997. Those with the gene -- both blacks and whites -- made increasingly more cognitive errors over time on a questionnaire that assessed knowledge of items such as the day, date and current president than those without the gene.

Source: Florida State University