UW–Madison: Researchers pursue easier, earlier detection of Alzheimer’s disease in Black adults

Posted on Thursday, Dec 7, 2023

MADISON, Wis. – A blood biomarker and a method of testing cognitive processes such as memory and thinking could hold promise for identifying middle-aged Black people who are at risk for later developing Alzheimer’s disease, according to a new study from the University of Wisconsin School of Medicine and Public Health.

Black Americans are almost twice as likely to develop Alzheimer’s disease and other dementias but tend to be diagnosed and treated later in the disease process. Members of the Black community have been underrepresented in research on predicting and treating dementia, so it was unknown if markers that predict dementia in white patients also applied to them, according to the study’s lead author Barbara Fischer, assistant professor of neurology at the UW School of Medicine and Public Health.

“The sooner we can identify people at risk for Alzheimer’s, the sooner they can be treated, which is especially important with new medications being developed to slow the progression of the disease,” said Fischer, who holds a doctorate in psychology. “Ensuring early identification of Black Americans with Alzheimer’s disease can help change some of the health disparities that make this disease so much worse in the Black population.”

The study looked at cognitive testing and blood samples from 257 Black participants in the African Americans Fighting Alzheimer’s in Midlife, or AA-FAIM, study at the Wisconsin Alzheimer’s Disease Research Center. Nearly 83% of those participating in the study had no symptoms of mild cognitive impairment or Alzheimer’s disease at the beginning of the study. Researchers conducted follow up

testing with 184 study participants for an average of four years.

The research team used a type of testing called intra-individual cognitive variability, which measures the fluctuation in an individual's cognitive performance. More variability in thinking, memory, and similar behaviors is associated with neurodegenerative disorders such as Alzheimer's disease. Because this method of testing compares oneself with oneself, it is less subject to biases including racial bias. Fischer's team found that intra-individual cognitive variability was an accurate reflection of cognitive function in Black Americans, as had been found previously in non-Hispanic white populations.

Her group also looked at blood samples from 235 of the participants. They found that lower baseline plasma beta amyloid, a naturally occurring protein in the body and a hallmark biomarker of Alzheimer's disease, was not immediately linked to how well a study participant performed on the cognitive tests at baseline. However, a pattern emerged over years of follow-up studies that linked lower blood plasma beta amyloid with worse cognitive performance. While the pattern did not rise to the level of statistical significance, the researchers are hopeful that larger studies over longer periods of time will clarify the association between plasma beta amyloid and cognitive performance. Further research is needed to confirm these findings but they are consistent with similar results found in other studies among non-Hispanic whites, suggesting that previously published findings likely apply to Black Americans as well.

The AA-FAIM cohort was established in 2016 and the sample size is small; however, as participants age, these data will become increasingly informative, according to Fischer. Additional limitations of the study included that participants were relatively young and well educated, and that the threshold for plasma beta amyloid was developed on a mostly white sample, calling into question the generalizability of the findings.

"We hope that as more participants enroll in this study, and as those participants continue to age, we can further establish associations between biomarkers and cognition so we can accurately and consistently predict Alzheimer's disease pathology across diverse populations," Fischer said.

Biomarkers of Alzheimer's disease, including amyloid beta and neurofibrillary tau, have to date also been measured through PET scans to assess levels in the brain and lumbar puncture to assess levels in cerebrospinal fluid. These methods are

invasive, expensive to administer and require specialized equipment and are often aversive to many in the Black community. It will be beneficial to establish less invasive methods that can be conducted in the community via a cognitive assessment and simple blood draw, according to Fischer, who explains that this would reduce barriers for Black people at risk for Alzheimer's disease.

"A blood-based test and a quick cognitive exam could be a practical, low-cost and noninvasive way to screen people for the disease and increase access to clinical evaluation or research participation," she said.

Fischer is part of the team at the William S. Middleton Memorial Veterans Hospital in Madison and UW–Madison Memory Assessment Clinics. The senior author of the paper is Carey Gleason, principal investigator of AA-FAIM and associate professor of medicine at the UW School of Medicine and Public Health.

The study was published in the Journal of Translational & Clinical Interventions.

Funding support was provided by National Institutes of Health (grants R01AG054059, P50AG033514, P30AG062715, R01AG27161, K23AG067929, the Alzheimer's Association (grant AARF-18-562-958), and the U.S. Department of Veterans Affairs Health Services Research & Development Service, VA Office of Research & Development (grant IK2 HX003080).