For African American moms, giving birth to multiple children could be linked to Alzheimer's disease, study shows

July 17 2024, by Kathleen O'Brien

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Women have long sensed that motherhood takes a toll.
From the folk wisdom of losing a tooth or gaining a shoe size with each pregnancy, to jokes that children can give you gray hairs or "get on your last nerve," society seems to know the toll can be physical.

A new study out of Rutgers-Newark's Center for Molecular and Behavioral Neuroscience reveals a little-known burden for African American mothers: Giving birth to multiple children might be linked to developing Alzheimer's disease. The results are published in *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*.

The possible connection is not unique to African Americans. International studies across three continents previously established that women with five or more children have a greater risk of cognitive decline. However, that research looked mostly at white or European mothers.

By focusing exclusively on African-American mothers, this study confirms those broader findings apply to them, too.

That's important because African-American women face three challenges when it comes to Alzheimer's: Women (of all races) are more likely to develop the disease, African Americans are more than twice as likely as white people to get Alzheimer's, and African Americans are understudied in medical research.

Lead author Salma M. Abedullah, a graduate student and researcher who devised the study, said she was intrigued by the notion that whether someone is male or female could play a role in the development of Alzheimer's and sought to address the paucity of research about pregnancy in particular.

The data revealed repeated pregnancies are associated with worse
cognition test scores decades later.

The culprit may be estrogen—or rather, the lack of it.

While a woman's estrogen level typically soars during pregnancy, it plummets after birth, sinking lower than it was before.

"The reason we're focusing on estrogen is because it is a protective hormone for the brain," said senior faculty researcher Bernadette Fausto. "When a woman has less of it over the years, either through repeated childbearing or menopause, there is less protection for her brain."

But there are ways for moms to lower the risk of cognitive decline.

"The take-away message here is it's important that women who have multiple children set aside time to protect their brains with exercise, sleep, and intellectual stimulation—all known lifestyle factors that can reduce risk for Alzheimer's disease," said Mark Gluck, senior author of the study and director of the Aging and Brain Health Alliance program.

The 146 women in this test had no cognition problems at the time of the study.

Researchers gave them two different cognition tests. The first was a standard memory test given to screen for Alzheimer's. In that test, an examiner reads a list of 15 words, then asks the participant to recall as many of those words as possible. Once that process is repeated five times, a different list of words is introduced as a distraction. Twenty minutes later, participants are asked once again to recall the original 15 words.

This test picked up virtually no differences associated with the number of children a woman had.
The second test, devised in part by Gluck, is more subtle: It first trains respondents to find patterns between different shapes and colors, then asks the respondents to take what they've learned and apply the rules to a new set of images. Called the Rutgers generalization test, it has already demonstrated its ability to pick up slight brain decline years before such changes are noticed by friends and family.

This test did spot clear associations with childbearing:

- Women with three or more children committed more errors on the test than women with just one or two children. Those errors may turn out to be a harbinger of Alzheimer's at some point down the road.
- There was a significant difference in errors between women who had one child compared to women who had four.
- There was even a difference between two and three children, and two and four children.
- There was virtually no difference between having one or two children.
- The study focused on biological children only. Miscarriages didn't count for this study's purpose, nor did adopting a child or raising a relative's child. The most common number of children reported by the participants was two; the highest number, seven.

Having no live-in partner and having less formal education were factors that exacerbated the risk to mothers.

Fausto conceded it's hard to know how much of a mother's stress is caused by biology, and how much is due to those outside factors. Having a partner may mean a new mother gets more sleep, for example, or has a financial cushion that alleviates worry.

"It's hard to tease out what's biology versus lived experience," she said.
"I'm sure it's both that contribute, and it might be the estrogen as well as the stress of being a mother."

She noted, however, no similar link to Alzheimer's has been spotted with fatherhood. "There isn't that finding with fathers," she said.

As for the next step for researchers, that's an easy decision: They want to get brain scans of the study volunteers to see if there are any visible differences associated with the number of pregnancies.

Where does this study leave African-American women who have already three or more children? They can hardly turn back the clock—nor would they likely want to.

Or, as Abedullah's own mother, who has four children, asked when her daughter told her of the study results, "What do I do now?"

"I said, 'It's important to just work on brain health. Make sure you're eating brain-healthy foods like avocado or berries, that are anti-inflammatory. Go out with friends, be social, things like that. Exercise. Get quality sleep,'" Abedullah said she told her mother. "'Take care of what you have now.'"


Provided by Rutgers University
Citation: For African American moms, giving birth to multiple children could be linked to Alzheimer's disease, study shows (2024, July 17) retrieved 5 August 2024 from https://medicalxpress.com/news/2024-07-african-american-moms-birth-multiple.html

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