

Is a longer reproductive lifespan good for your brain?

September 27 2023



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People with a higher cumulative estrogen exposure throughout their life may have a lower risk of cerebral small vessel disease, according to a new study published in the September 27, 2023, online issue of *Neurology*.

Cerebral small vessel disease, a form of cerebrovascular disease, results

from damage to [small blood vessels](#) in the brain. It raises the risk of cognitive impairment and dementia.

"Previous research has shown that rates of cerebrovascular disease increase after menopause, which is often attributed to the absence of hormones," said study author Kevin Whittingstall, Ph.D., of the University of Sherbrooke in Quebec, Canada. "It remains unknown whether the amount of exposure to hormones before menopause extends that window of protection to after menopause."

Researchers looked at the relationship between [lifetime hormone](#) exposure, or the number of times a person has been pregnant and their reproductive lifespan, and [white matter hyperintensities](#), a common biomarker of vascular brain health that develops with age.

The study involved 9,000 postmenopausal female participants with an average age of 64 living in the United Kingdom. They did not have cerebral small vessel disease at the start of the study.

Participants answered questions on reproductive health information, including age at first menstruation and start of menopause, number of pregnancies, oral contraceptive use and [hormone therapy](#).

Participants also had brain scans to look for cerebral small vessel disease by estimating white matter hyperintensities, which indicate injury to the brain's white matter.

Researchers calculated lifetime hormone exposure by adding up the number of years participants were pregnant with the duration of their reproductive lifespan, which is the number of years from first menstruation to menopause. The average lifetime hormone exposure was 40 years.

After adjusting for factors like age, [high blood pressure](#), and smoking, researchers found that participants with higher lifetime hormone exposure had lower white matter hyperintensity volumes. Average total white matter hyperintensity volume was 0.0019 milliliters (ml). They found that people with higher lifetime hormone exposure had a smaller volume of white matter hyperintensities, with a difference of 0.007 ml compared to people with lower lifetime hormone exposure.

Researchers also calculated the lifetime hormone exposure by adding up the number of years participants took oral contraceptives and hormone replacement therapy. These factors did not alter the effect the number of pregnancies and number of reproductive years had on white matter hyperintensities.

The number of pregnancies participants had and their number of reproductive years both affected white matter hyperintensity volumes independently

"Our study highlights the critical role of reproductive history in shaping the female brain across the lifetime," said Whittingstall. "These results emphasize the need to integrate reproductive history into managing brain health in postmenopausal women. Future research should investigate ways to develop better hormonal therapies."

A limitation of the study was that information on reproductive factors was collected mainly based on participants' ability to recall events, and participants may not have remembered such events correctly.

The study does not prove that lower estrogen exposure causes cerebral small vessel disease; it only shows an association.

More information: Samantha Cote et al, Association of Cumulative Lifetime Exposure to Female Hormones With Cerebral Small Vessel

Disease in Postmenopausal Women in the UK Biobank, *Neurology* (2023). [DOI: 10.1212/WNL.0000000000207845](https://doi.org/10.1212/WNL.0000000000207845).
[n.neurology.org/content/early/ ... WNL.0000000000207845](https://n.neurology.org/content/early/.../WNL.0000000000207845)

Provided by American Academy of Neurology

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