

High blood pressure in younger adults linked to midlife brain changes

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High blood pressure among younger adults, ages 20-40 years, appears to be linked to brain changes in midlife (average age 55) that may increase risk for later cognitive decline, according to preliminary research to be

presented at the American Stroke Association's International Stroke Conference 2022.

According to the American Heart Association, from 2015-2019 more than 47% of U.S. adults had high blood pressure. In 2019, the U.S. age-adjusted death rate primarily attributable to high blood pressure was 25.1 per 100,000. High blood pressure death rates for non-Hispanic Black adults were 56 per 100,000 among males and 38.7 per 100,000 for females.

Studies have found that high blood pressure disrupts the structure and function of the [brain](#)'s blood vessels, damaging regions of the brain that are critical for cognitive function.

"There are studies to suggest changes to the brain may start at a young age," said Christina Lineback, M.D., lead study author and a vascular neurology fellow at Northwestern Memorial Hospital in Chicago. "Our study provides further evidence that high blood pressure during young adulthood may contribute to changes in the brain later in life."

Researchers analyzed 30 years of follow-up including MRI brain images (performed once at the age of 30, and then again at midlife—about the age of 55 years) for 142 adults from the Coronary Artery Risk Development in Young Adults (CARDIA) study. The CARDIA study enrolled participants from four U.S. cities (Birmingham, Alabama; Chicago, Illinois; Minneapolis, Minnesota; and Oakland, California), in 1985-1986. In total, the study recruited more than 5,000 Black and white adults, ages 18 to 30 years, who have been followed for over 30 years.

In one follow up including 142 of the participants (42% women), researchers examined changes in brain structures in midlife (average age 55) from cumulative exposures to vascular risk factors, including high blood pressure, cholesterol, body mass index, smoking and glucose, from

young adulthood to midlife. They also evaluated if there were any differences by race or ethnicity; nearly 40% of the study participants (n=55) were Black adults.

The analysis found:

- Younger adults who had higher cumulative blood pressure exposure (from 25 to 55 years of age) had more changes visible on brain imaging at midlife, which may increase the risk of cognitive dysfunction in mid- and late life.
- The brain changes that occurred were similar across all races and [ethnic groups](#) examined in the study when accounting for the degree of high blood pressure exposure.

"We were surprised that we could see brain changes in even this small sample of participants from the CARDIA study," Lineback said. "Given the greater likelihood of high blood pressure in some racial and ethnic groups, this study's finding should encourage [health care professionals](#) to aggressively address high blood pressure in young adults, as a potential target to narrow disparities in brain health."

A potential next step is to develop and implement systems to better treat and monitor [blood pressure](#) in young age groups and assess for brain changes over time, according to Lineback.

A limitation of the study is that it is a retrospective analysis, which means the findings cannot prove the brain changes were caused by [high blood pressure](#).

Provided by American Heart Association

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