

Editorial

Premature Brain Aging and Hypertension: The Link

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Having even mildly elevated blood pressure at midlife prematurely ages the brain, a new study shows.

Researchers say the early changes seen with higher blood pressure may set the stage for problems with thinking, memory, and dementia down the road. "This is an important finding," says Paul Rosenberg, MD, associate professor of psychiatry and behavioral sciences at Johns Hopkins University in Baltimore, Md.

"There's a suggestion here that we should be treating blood pressure more aggressively in younger people," says Rosenberg, who was not involved in the research. The study used magnetic resonance imaging (MRI) to take a snapshot of the brains of 579 healthy adults who were participating in the third generation of the long-running Framingham Heart Study. People in the study ranged in age from 19 to 63, but on average they were around 39. Doctors measured each person's blood pressure twice and took the average of the numbers.

Those who had elevated blood pressures showed more signs of early changes on detailed brain scans than those with normal blood pressure. Normal is a systolic pressure (the top number) under 120 and a diastolic pressure (the bottom number) under 80. People who had prehypertension, meaning that their systolic pressure was between 120 and 139 or their diastolic blood pressure was between 80 and 89, had brains that looked about 3.3 years older than normal. Those with high blood pressure, meaning they had a systolic number over 140 or diastolic number over 90, had brains that looked about 7.2 years older. About 50 million Americans have elevated blood pressure. It's estimated that less than 60% of people who know they have hypertension are treated for it. Only about a third of those people ever get it under control. "These changes are subtle," says researcher Charles S. DeCarli, MD, director of the Alzheimer's Disease Center at the University of California, Davis. DeCarli says people who have them probably wouldn't notice any problems with thinking or memory because of them, though those things were not measured for the study. But the changes they saw "are very consistent," DeCarli says, and they look

like the beginnings of the kind of damage that's been seen in the brains of people with full-blown dementia and Alzheimer's disease.

In particular, the white matter, which is sometimes called the wiring of the brain because it carries nerve signals between brain areas, was starting to look frayed. While the grey matter, which makes up the bulk of the brain's lobes, was starting to shrink. "This is quite disconcerting because high blood pressure is so common," DeCarli says. "I worry this can be harmful over time and cause late-life cognitive disability if not aggressively treated."

This study doesn't prove that high blood pressure alone caused the brain changes. Other studies have shown that diets high in saturated fat and sugar, the same eating patterns that are thought to contribute to obesity and high blood pressure, play a role in changes in the brain that are thought to lead to Alzheimer's disease. But long before Alzheimer's and dementia became commonly used terms, doctors said people with progressive memory loss had "hardening of the arteries," which describes what happens when elevated blood pressure damages artery walls, making them stiff and less elastic.

So far, studies looking at whether lowering high blood pressure with medications and lifestyle changes might help brain function have had mixed results. Treatment has mostly been tried in older adults, however, who may already have structural damage in the brain that is beyond repair. Experts think the most effective way to help the brain and other organs that are damaged by high blood pressure may be to catch and treat high BP as early as possible.

"Dementia doesn't start in old age. It starts way long before that," says Merrill Elias, PhD, MPH, professor of neuropsychology and epidemiology at the University of Maine in Orono.

Elias has spent his career studying the effects of blood pressure on the brain. "The message from this paper and all the papers that have preceded it on cognitive functioning is that you must control high blood pressure from the moment it emerges," Elias says.