Even in young adults, blood pressure above normal may be linked to brain shrinkage

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For people in their 20s and 30s, having blood pressure above normal but below the level considered to be high blood pressure, may be linked to loss of brain volume, according to a study published in the January 23, 2019, online issue of *Neurology*, the medical journal of the American Academy of Neurology.

People with blood pressure above normal were more likely to have a loss of volume in the gray matter in certain areas of the brain than people with normal blood pressure. Healthy blood pressure is less than 120/80 millimeters of mercury (mmHg). For this study, high blood pressure was defined as above 140/90 mmHg.

"Previously the assumption has been that brain damage related to high blood pressure results over years of evident disease, but our study suggests that subtle changes in the brain's gray matter can be seen in young adults who have never been diagnosed with high blood pressure," said study author Arno Villringer, MD, of Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, Germany. "More research should be done to investigate whether this could increase the risk for stroke, dementia and other cerebrovascular diseases later in life."

Villringer said research could also help determine whether, when and how blood pressure above normal in young adults should be monitored and managed.

The study involved 423 people with an average age of 28 who had MRI brain scans and at least one blood pressure reading. A total of 41 percent had normal blood pressure, 29 percent had blood pressure from 120/80 to 129/84 mmHg, 19 percent had blood pressure from 130/85 to 139/89 mmHg and 11 percent had high blood pressure above 140/90 mmHg.

People with blood pressure above normal were more likely to have lower gray matter volume in areas of the brain including the frontal and parietal lobes, as well as the hippocampus, amygdala and thalamus. For example, compared to normal blood pressure, high blood pressure was related to reduced gray matter volume in a total of 581 brain voxels. Brain voxels in this study were each 2x2x2 mm in size. Of those, the largest effect was located in the left inferior frontal gyrus, one area of the brain that showed lower gray matter volume (107 voxels). Overall, the results showed that gray matter volumes decreased as blood pressure increased.

"While the study does not prove that above normal blood pressure causes these gray matter alterations, this research suggests that treating high blood pressure or maintaining lower blood pressure in early adulthood might be essential for preventing the cascade from silent brain changes with no symptoms to organ damaging conditions such as stroke and dementia," Villringer said.

Provided by American Academy of Neurology

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