Earlier onset of high blood pressure affects brain structure, may increase dementia risk

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Individuals who are diagnosed with high blood pressure at ages 35-44 had smaller brain size and were more likely to develop dementia compared to people who had normal blood pressure, according to new

research published today in *Hypertension*, an American Heart Association journal.

The results raise the possibility that taking steps in young adulthood to control or delay the onset of high blood pressure may reduce the risk of dementia.

"Hypertension is very common in middle-aged people (45-64 years), and early onset high blood pressure is becoming more common. Although the association among hypertension, brain health and dementia in later life has been well-established, it was unknown how age at onset of hypertension may affect this association. If this is proven, it would provide some important evidence to suggest earlier intervention to delay the onset of hypertension, which may, in turn, be beneficial in preventing dementia," said Mingguang He, M.D., Ph.D., senior author of the study and professor of ophthalmic epidemiology at the University of Melbourne in Melbourne, Australia.

The researchers analyzed data from participants in the UK Biobank, a large database containing detailed anonymous health information of about half a million volunteer participants in the United Kingdom. To determine brain changes, they compared magnetic resonance imaging (MRI) measurements of brain volume between two large groups of adults in the database: 11,399 people with high blood pressure diagnosed at different ages (younger than age 35; 35-44 years; and 45-54 years), and 11,399 participants who did not have high blood pressure, matched for age and multiple health-related variables. Participants entered the databank between 2006 and 2010, and they had MRI brain scans between 2014 and 2019. Hypertension in this study was defined as reporting a diagnosis of hypertension (told by a doctor) or inpatient records using the codes for international classification diseases. The blood pressure reading at the time of their MRI scans was controlled in the analysis.

From the MRI scans, the investigators found:

- In each diagnostic age category (from 35 to 54), the total brain volume was smaller in people diagnosed with high blood pressure, and the brain volume of several regions were also smaller compared to the participants who did not have high blood pressure;
- Hypertension diagnosed before age 35 was associated with the largest reductions in brain volume compared with controls; and
- Among people with normal blood pressure readings at the time of their MRI scans, those who were previously diagnosed with hypertension at