Genetic risk for high blood pressure associated with poorer cognitive function

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New research led by University of New South Wales Sydney's Center for Healthy Brain Aging (CHeBA) finds that genetic risk for higher blood pressure even in those in their 40s and 50s may contribute to

poorer cognitive function.

"This research is groundbreaking. Previously, the literature generally indicated that the cognitive effects of high blood pressure were not seen until late in life. We have found that there are subtle but real changes several decades earlier," says Dr. Matt Lennon, lead author on the study and a researcher at the Center for Healthy Brain Aging (CHeBA).

"However, the relationship of blood pressure with brain function is complex. Those with a genetic predisposition to higher blood pressure had significantly better reaction time, particularly in males," says Dr. Lennon.

"We know that high blood pressure is remarkably common in the community, especially among males, and part of this may be explained by the fact that there are some genetic advantages to this in reaction time—measuring how quickly an individual responds to a stimulus—although ones that come at the long-term costs of poorer cognitive health and greater risks of heart attacks and strokes," says Dr. Lennon.

The study, published in the journal *Hypertension*, used novel approaches to generate deeper insights into a previously studied area. It used "big data" from the UK Biobank, including 448,575 participants, and differed from many previous studies by using a genetic quantification of blood pressure risk rather than measurement of blood pressure directly, which is frequently inaccurate.

The study suggests that in the future prevention strategies for cognitive decline may be more targeted and personalized based on an individual's genetic risk for high or low blood pressure, as well as their age and sex. Interestingly, the study also found that for those in their 60s marginally higher blood pressures may be optimal for maintaining cognitive ability,

compared to those in their 40s and 50s.

Co-Director of CHeBA and co-author Professor Perminder Sachdev, said, "Hypertension impacts over 1 billion individuals worldwide and is the single, most prevalent risk factor for cognitive decline.

"It is critical we understand the complexities of this modifiable risk factor for dementia, particularly in people in their 40s and 50s, to develop strategies of earlier intervention and prevention of cognitive decline and dementia," says Professor Perminder Sachdev.

More information: Matthew J. Lennon et al, Genetically Predicted Blood Pressure and Cognition in Midlife: A UK Biobank Study, *Hypertension* (2023). DOI: 10.1161/HYPERTENSIONAHA.123.21612

Provided by University of New South Wales

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