

Developing topics

Hypertension produces a cumulative negative effect on cognition independently of diabetes in late life

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Abstract

Background: Hypertension impacts approximately 33% of US adults broadly, and specifically 65% of persons over 60 years of age. Previous research has shown that hypertension produces damage in cerebral blood vessels, leading to neuropathological changes and possibly promoting Alzheimer's disease pathology. Hypertension is often comorbid with diabetes mellitus (DM). While most studies show an association of hypertension and DM with worse cognition, the time course of emerging cognitive deficits related to hypertension in late-life is less clear. This study contrasted older adults with and without self-reported hypertension and diabetes at two time points in late-life ($M_{\text{Baseline age}} = 64.3$ years, $SD_1 = 0.7$; $M_{\text{Follow-up age}} = 71.2$ years, $SD_2 = 0.9$), separated by approximately seven years.

Methods: Participants included 4,594 1957 high school graduates from the Wisconsin Longitudinal Study, a publicly available database that includes high school graduates who were followed longitudinally until 2011. Cognitive, demographic, and health variables from the 2003-2005 (baseline) and 2011 (follow-up) waves were used. Cognitive assessment included Letter Fluency, Category Fluency, Digit Ordering, Similarities, and Immediate and Delayed Recall of a 10-word list. Bayesian independent t-tests examined the effect of self-reported hypertension on cognition at baseline and follow-up, as well as the effect of self-reported hypertension on cognition in persons with and without diabetes.

Results: Self-reported hypertension over seven years was associated with worse Digit Ordering and Letter and Category Fluency performance at follow-up, relative to persons without self-reported hypertension. No baseline cognitive differences were observed between groups. Participants with self-reported hypertension showed greater decline in Letter Fluency and Digit Ordering compared to persons without self-reported hypertension. Diabetes negatively impacted cognition at baseline, follow-up, and over the seven-years. However, the negative effect of hypertension on cognition was still present in the absence of diabetes.

Conclusions: While no cognitive differences between persons with and without hypertension in their mid-60s were observed, cognitive decline in persons with self-reported hypertension was observed over seven years. These findings suggest a cumulative neg-

ative impact of hypertension on cognition, particularly in late-life, exclusively on measures of executive functioning rather than on episodic memory measures. Additionally, the effects of hypertension on cognition were independent of the cognitive effects of diabetes.