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Introduction: Midlife vascular risk factors such as hypertension, obesity and hypercholesterolemia are linked with increased risk of dementia and Alzheimer's disease. However, the mechanisms have remained unclear for most part.

Aims: Our aim is to elucidate the association between midlife vascular risk factors and late-life cortical thickness.

Methods: CAIDE (Cardiovascular risk factors, Aging and Incidence of Dementia) is longitudinal population-based study performed in Eastern Finland. Participants were studied first time in 1972, 1977, 1982 or 1987 (n=2000) and 1st re-examination was performed in 1998-1999 and 2nd re-examination in 2005-2008. MRI was taken from all dementia suspects and current study includes all MCI cases scanned in 2nd re-examination whose image quality was sufficient enough for cortical thickness analysis (n=63). Measurements of cortical thickness were performed using a pipeline method developed at the McGill University, Montreal, Canada.

Results: Subjects with midlife hypertension (SBP>160 and/or DBP>95) had significantly thinner cortical thickness in 10 different regions compared to normotensives: insular cortex and orbitofrontal area were affected bilaterally among others. Analyses were adjusted for age, sex, follow-up time, scanner type and late-life anti-hypertensive treatment. In further analyses midlife SBP and pulse pressure showed linear relationship with decreasing cortical thickness in right insular cortex, r=-0.507 and r=-0.569 respectively. No association was noticed between midlife or late-life obesity and hypercholesterolemia and cortical thickness.

Conclusions: Using a novel fully automatic surface-based method for measuring cortical thickness, we suggest that midlife hypertension is associated with cortical thinning in areas related to blood pressure regulation and dementia.