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## Pulse Pressure Elevation Could Presage Cerebrovascular Disease in Alzheimer's Patients

Researchers at the University of California, San Diego and Veterans Affairs San Diego Healthcare System have shown that elevated pulse pressure may increase the risk of cerebrovascular disease (CVD) in older adults with Alzheimer's disease (AD). Their study has been published in the early online edition of *Journal of Alzheimer's Disease* in advance of the June 5 print publication.

The findings may have treatment implications, since some antihypertensive medications specifically address the pulsatile component of blood pressure. Pulse pressure (PP) – the difference between systolic and diastolic pressure – is one measure of the pulsatile component of blood pressure. PP increases substantially with age, partially due to hardening of the arteries.

Hypertension is a common risk factor for AD, but the use of antihypertensive medications to prevent dementia has had mixed results. Most studies examining the effects of blood pressure on the risk of AD have focused on standard measures of blood pressure, the systole and diastole readings. However, scientists theorized that PP elevation may impair the clearance of beta amyloid – a hallmark of AD – from the brain. Other studies have suggested that PP elevation may contribute to AD risk indirectly by increasing the risk of CVD.

The researchers, led by Mark W. Bondi, PhD, of VA San Diego Healthcare System and UC San Diego Department of Psychiatry, looked at 65 patients who later met the criteria for AD at autopsy. These patients were examined before death for relationships among blood pressure and neuropathologic markers. More than half of them were found, at autopsy, to have CVD.

“The association between PP and CVD was independent of dementia severity and the presence of other vascular risk factors,” said Bondi. “Interestingly, standard measures of blood pressure were not significantly associated with the presence of CVD.”

The study suggests several conclusions: that elevated blood pressure in older adults with AD is related to CVD but not AD pathology; that CVD may be more closely associated with PP than systolic or diastolic pressure; and that, in AD patients, PP elevation may be influencing cognition through effects on CVD.

The study's first author, Daniel A. Nation, PhD, of the VA San Diego Healthcare System, concluded the findings offer possible treatment implications. "Antihypertensive treatments targeting the pulsatile component of blood pressure may reduce the vascular contribution to cognitive impairment in AD patients or in individuals at risk of AD."

Additional contributors include Lisa Delano-Wood, PhD, Christina E. Wierenga, PhD and Amy J. Jak, PhD, VA San Diego and UC San Diego Department of Psychiatry; Katherine J. Bangen, PhD, UC San Diego Department of Psychiatry; Lawrence A. Hansen, MD, UC San Diego Departments of Neurosciences and Pathology; Douglas R. Galasko, MD, VA San Diego and UC San Diego Department of Neurosciences; and David P. Salmon, PhD, UC San Diego Department of Neurosciences.

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