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Abstract TP187: 24-hour Ambulatory Blood Pressure, Cognitive Performance, and Cerebral Microbleeds in the Elderly

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Abstract

Introduction: Multiple studies suggest a role for blood pressure (BP) variability and nocturnal BP dipping in the development of cerebrovascular disease and cognitive impairment. We analyzed cross-sectional data from a cohort of 90+ year-olds to test the hypothesis that BP variables are associated with cognitive function and cerebral microbleeds (CMB).

Methods: Study subjects were 121 participants (mean age = 93 years, 63% female) in The 90+ Study, a study of aging in individuals aged 90 years and older from a California retirement community. Participants were given a neuropsychological test battery to determine cognitive status. All subjects underwent 24-hour ambulatory BP measurement with a automatic device. MRI scans were available for 26 participants. Over three time frames (24-hour, daytime, nighttime) and separately for SBP and DBP, we represented BP by mean, minimum, maximum, standard deviation (SD), coefficient of variation, average real variability, percentage of high measurements (≥ 140 mmHg for SBP and ≥ 90 mmHg for DBP), percentage of low measurements (< 90 mmHg for SBP and < 60 mmHg for DBP), and nocturnal dip (% change of mean night BP from mean day BP). Differences in means of BP variables between groups based on cognitive status (normal vs cognitively impaired not demented (CIND)/demented) and presence/absence of CMB were tested using t-tests.

Results: Cognitive status was normal in 97 subjects, CIND/demented in 24. Mean nocturnal dips (both SBP and DBP) differed significantly between the two groups, with normal participants having on average greater dip levels (6.6 vs 1.3, $p=0.006$ for SBP and 11 vs 4.4, $p=0.002$ for DBP). No other BP variable showed a large or significant difference. Greater nocturnal dips were also related to better performance on cognitive test scores related to language, recent memory, and visual-spatial ability. MRI findings showed subjects with CMB ($n=18$) had higher SD of daytime SBP than those without ($n=8$) (20 vs 16, $p=0.03$). Those with CMB also had a greater proportion of high nighttime DBP (≥ 90 mmHg) readings (3.6 vs 0, $p=0.03$).

Conclusions: Among 90+ year olds, altered nocturnal BP dipping may have a role in cognitive impairment, while SBP variation and diastolic hypertension may contribute to development of microbleeds.

Footnotes

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