

## SESSION 3280 (POSTER)

## CARDIOVASCULAR DISEASE

## AUGMENTATION INDEX IS A PREDICTOR OF CEREBRAL BLOOD FLOW ACROSS GLOBAL GRAY MATTER IN THE ELDERLY

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Arterial stiffness and blood pressure (BP) are contributors to cognitive decline and dementia. Lower global cerebral blood flow (CBF) is one of the earliest manifestations of biological alterations linked to cognitive decline, nevertheless the best cardiovascular predictor of CBF in gray-matter (CBF-GM) remains to be identified. Our objective is to determine the best predictor of CBF-GM levels amongst cardiovascular parameters. Eighty-four healthy participants between 60-80 years-old were evaluated. The measured parameters for arterial stiffness were the carotid-femoral pulse wave velocity (cf-PWV) and the augmentation index (Aix), measured by applanation tonometry (SphygmoCor). Mean systolic BP (SBP) was monitored over 24-hours and analyzed following Hypertension-Canada's guidelines(2018). The coefficient of variation for 24-hours SBP was calculated by dividing the standard deviation by the mean. Resting CBF-GM was quantified from pseudocontinuous arterial-spin-labeling using Neurolens 2.0(pcASL), and acquired on a 3T scanner (MAGNETOM Prisma-Fit). We created multiple linear regression models for each independent variable (cf-PWV, Aix, mean-SBP in 24 hours and the coefficient of variation of 24-hours SBP) using age, sex, schooling and body mass index as covariates. Multiple linear regression models demonstrated that two independent variables could predict CBF-GM levels: a)PWV ( $p=0.010$ ) and b)Aix ( $p=0.006$ ). In this cohort, we demonstrated that while PWV and Aix are both predictors of CBF-GM levels, it is Aix which has the highest predictive value and could be a useful tool to understand the interplay between lower CBF-GM and arterial stiffness. These results also indicate that Aix may be a good therapeutic target to preserve brain health and cognition.

## ASSOCIATION BETWEEN BLOOD PRESSURE AND COGNITIVE FUNCTION OF COMMUNITY-DWELLING OLDEST OLD IN OKINAWA, JAPAN

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Background: Adults 80 years and older are the fastest-growing segment of the Japanese population and face a high risk of cognitive decline. There are some evidences connecting hypertension to cognitive decline. In mid-life hypertension is known to have influence the cognitive decline in older age. However, a few study have examined the association between hypertension or vascular stiffness and cognitive function among elderly over 80 years old. We analyzed the associations between vascular stiffness and cognitive function among relatively healthy community-dwelling non-demented oldest old. Method: Data came from the Keys to Optimal Cognitive Aging (KOCOA) study; an ongoing cohort of relatively healthy volunteers aged over 80 years old, living in Okinawa, Japan. In 2017, 105 non-demented (Clinical Dementia Rating < 1) subjects completed three kinds of examination for vascular function (75 % female, mean age (SD) 84.0 (3.0)). We categorized subjects into low and high cognitive function groups using Montreal Cognitive Assessment (MoCA) (25/26 as a cutpoint). Logistic regression models were used to examine the association between cognitive and vascular functions. Results: Narrower pulse pressure, an indicator of lower arterial stiffness, was associated with better cognitive function among subjects, after adjusting for gender, age, and education ( $p \leq 0.05$ ), although systolic and diastolic blood pressure were not. Conclusion: Our findings suggest that narrower pulse pressure is related with cognitive preservation. The present study supports the hypothesis that lower arterial stiffness is related with better cognitive function even among the oldest old.

## EFFECT OF INFLUENZA VACCINE ON TWEAK LEVELS IN THE ELDERLY: IMPLICATION IN CARDIOVASCULAR PROTECTION

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Substantial evidence suggests a protective effect of annual influenza immunization on cardiovascular diseases (CVD). The inflammatory mediator TNF-related weak

inducer of apoptosis (TWEAK) is thought to be involved in the pathogenesis of CVD. We previously showed that administration of a standard-dose influenza vaccine reduced circulating TWEAK levels. This study aimed to test the hypothesis that a high-dose vaccine would have greater impact on TWEAK levels than the standard-dose. Two groups of participants matched on age and sex were included in the study. One group (n=25) received standard-dose vaccine during 2008-2009 season, the other group (n=25) received high-dose vaccine during 2014-2015 season. Soluble TWEAK (sTWEAK) levels were assessed using ELISA in serum samples collected immediately before vaccination and during the 4th week after vaccination. Vaccine-induced strain specific antibody titers were measured by hemagglutination inhibition assay. The participants had a mean age 86 years and 68% were women. Our preliminary results thus far demonstrated no statistically significant change in sTWEAK levels after vaccination in either group (Wilcoxon matched-pairs signed rank test: standard-dose group: median change [interquartile range]=11.2 [-92.2-197.1] pg/mL, p=0.72; high-dose group: -24.8 [-58.9-87.3] pg/mL, p=0.70). Pre-vaccination sTWEAK levels tended to be negatively associated with age (unadjusted linear regression of  $\log_2(x)$  transformed TWEAK levels on age: estimate [ $\pm$ SE]=-4.6% [ $\pm$ 2.7%] change in TWEAK level per year, p=0.08). We continue to evaluate more pre- and post-vaccination samples. We have also begun exploring TWEAK expression by circulating immune cells (T and B lymphocytes and monocytes) and potential impact of influenza immunization in older adults.

#### THE ASSOCIATION BETWEEN VITAMIN K STATUS AND CARDIOVASCULAR DISEASE IN OLDER ADULTS

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A role for vitamin K in cardiovascular disease (CVD) has been proposed because vitamin K-dependent proteins are present in vascular tissue. We evaluated the association between vitamin K status and incident CVD and mortality in older adults from the Health, Aging, and Body Composition Study (Health ABC), and conducted a replication analysis using the Multi-ethnic Study of Atherosclerosis (MESA). In both cohorts circulating phylloquinone (vitamin K1), measured from baseline fasting blood samples, was categorized as  $\leq 0.5$ nM,  $>0.5$ - $\leq 1.0$ nM, and  $>1.0$ nM. Multivariable Cox proportional hazards models assessed the association between circulating phylloquinone and risk of a composite of CVD and mortality. In Health ABC (n=1246, mean age 74 years, 57% female, 58% Caucasian), over a median 11.5 follow-up years, participants with  $\leq 0.5$  nM plasma phylloquinone (n=351) had a 27% higher risk for CVD and mortality compared to those with  $>1.0$ nM (n=457) [adjusted hazard

ratio (95% confidence interval) (HR(95%CI)): 1.27(1.06-1.52)]. However, the risk for CVD and mortality did not differ between those with  $>0.5$ - $\leq 1.0$ nM (n=438) and with  $>1.0$ nM plasma phylloquinone [HR(95%CI): 1.03(0.87-1.52)]. Serum phylloquinone was similarly associated with CVD and mortality in MESA, over a median 12.1 follow-up years (n=764, mean age 62 years, 54% female, 35% Caucasian) [HR(95%CI), compared to those with  $>1.0$ nM (n=368):  $<0.5$ nM (n=253): 1.54(1.03-2.32);  $0.5$ - $\leq 1.0$ nM (n=153): 1.23(0.76, 1.98)]. Lower circulating phylloquinone was associated with a higher CVD and mortality risk in two independent cohorts. Additional studies are needed to corroborate our findings and clarify if certain segments of the population can derive cardiovascular benefit from improving vitamin K status.

#### CARDIOVASCULAR HEALTH AND SUCCESSFUL AGING: THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS

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Individual risk factors have been shown to be associated with successful aging. However, the combined effect of behaviors and biomarkers on successful aging remains unclear. By using the Multi-Ethnic Study of Atherosclerosis (MESA) dataset, this study was to examine the association of AHA's Cardiovascular Health (CVH) with successful aging. A total of 1,597 who were followed from baseline (2000-2002) at age 49-64 through exam 6 (2016-2018) at age 65-80 were included. CVH, including smoking, body mass index (BMI), physical activity, diet, blood pressure, cholesterol, and blood glucose, was measured at baseline. The CVH score, ranging from 0-14, was divided into ideal (11-14), intermediate (9-10), and poor (0-8) groups. Normal or successful aging, defined as avoiding major disease (including cancer, cardiovascular, or severe lung or kidney diseases), no disability, high cognitive function, high physical functioning, and engagement with life, was assessed at exam 6. We compared the cumulative incidence of successful aging among three groups. Modified Poisson regression model was employed to estimate relative risk (RR) adjusting for age, gender, race, education, income, marital status, and alcohol consumption. Among study participants at baseline, 36% were in ideal, 39% in Intermediate, and 25% in poor CVH. By exam 6, only 18% met the criteria for successful aging. Compared with the poor group, the adjusted RRs (95 % CI) of successful aging for the intermediate and ideal groups were 1.78 (1.23-2.56) and 2.56 (1.79-3.67). Our data suggest that CVH in midlife is associated with successful aging in later life.