ONLINE SUPPLEMENT

AORTIC PULSE WAVE VELOCITY PREDICTS FOCAL WHITE MATTER HYPERINTENSITIES IN A BIRACIAL COHORT OF OLDER ADULTS.

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Methods

Study Population

The cohort was followed prospectively to evaluate the relationship of changes in body composition, weight, and related health conditions to incident mobility disability. The cohort consisted of 3,075 well-functioning older black and white men and women living in Pittsburgh, PA and Memphis, TN[1]. Eligible participants were 70-79 years of age and reported no difficulty walking a quarter of a mile (400 m), climbing 10 steps, or performing activities of daily living[1].

Pulse Wave Velocity

A minimum of ten beats were recorded for each simultaneous recording run. Three separate runs were recorded for each participant, and all usable runs were averaged to calculate the final PWV measure. The distance between the carotid and femoral recording sites was measured above the surface of the body with a tape measure. The distance was divided by the time delay between the foot of the pressure waves at each site to calculate PWV in cm/s.[2]

Magnetic Resonance Image Acquisition

The magnetization-prepared rapid gradient echo T1-weighted images and fluid-attenuated inversion recovery images were acquired in the axial plane. Diffusion Weighted Images were acquired using single-short spin-echo sequence.[3-5]

White matter hyperintensities volume was obtained from T2-weighted FLAIR image using an automated method and normalized for brain volume[4, 6]. FA was obtained from Diffusion weighted images[7], using previously published processing steps[3-5]. Using the segmentation of white matter, gray matter, and WMH that were obtained from the T1-weighted and T2-weighted FLAIR images, the FA maps were restricted to normal appearing white matter.

The spatial distribution of white matter tracts was obtained using the JHU atlas[8]. Volume of the gray matter was calculated by segmenting the skull-stripped T1-weighted image in native anatomical space using the FAST - FMRIB's Automated Segmentation Tool[9]. Intracranial volume was measured using a T1-weighted image, BET with advanced option (−A) to extract additional skull and scalp surfaces[10].

References

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Table S1. Population characteristics of this study cohort (n=303) measured at study entry in 1997-98 and concurrent with the MRI in 2006-08. Means and standard deviations (SD) are reported, unless otherwise noted.

Population Characteristics	**Study entry**	**Time of MRI**
PWV, cm/sec	840.31 (412.68)	
BMI, m/kg^2	27.21 (4.54)	27.27 (4.48)
SBP, mmHg	137.08 (20.12)	135.14 (18.32)
DBP, mmHg	73.77 (9.66)	69.64 (9.65)
Pulse pressure, mmHg	63.31 (16.53)	64.74 (16.28)
Current Smoker, N (%)	15 (5)	6 (2)
DSST, points	42.54 (12.59)	38.50 (12.66)
MMSE, points	92.45 (6.24)	92.94 (8.29)
Diabetes, N (%)	36 (12)	83 (29)
Cardiovascular diseases, N (%)	49 (14)	83 (27)
Stroke, N (%)	12 (4)	24 (8)
Hypertension, N (%)	146 (48)	211 (70)
WMH volume, cm^3		6.00 (7.00)
Atrophy~~, cm^3~~		0.91 (1.41)
Fractional anisotropy		0.357 (0.014)

Table S2. Population characteristics of the parent cohort (N=1455) measured at study entry in 1997-98 and at follow-up in 2006-07. Means and standard deviations (SD) are reported, unless otherwise noted.

Population Characteristics	**Study entry 1997-98**		**Follow-up visit in 2006-07**	
	Mean	**SD**	**Mean**	**SD**
PWV, cm/sec	902. 76	(393.77)		
BMI, m/kg^2	27.7	(4.8)	27.6	(4.7)
SBP, mmHg	138.7	(21.1)	134.6	(20.5)
DBP, mmHg	74.3	(10.5)	69.2	(10.4)
Pulse pressure, mmHg	64.5	(17.3)	65.4	(17.5)
Current Smoker, N (%)	147	(10.1)	28	(3)
DSST, points	37.8	(13.8)	35.9	(13.4)
MMSE, points	90.6	(7.5)	91.2	(8.6)
Diabetes, N (%)	215	(15)	412	(28)^
Cardiovascular diseases, N (%)	410	(28)	534	(37)
Stroke, N (%)	129	(10)	171	(12)
Hypertension, N (%)	955	(67)	91	(93)$^{\$}$

^N=325 missing; $^{\$}$ n=178 missing.

Table S3. Mean, 25th and 75th percentile of white matter hyperintensities volume for each tract of interest.

		Median, cm^3	**25th - 75th percentile cm^3**
Superior Longitudinal Fasciculus	Left	0.001	0 -.014
	Right	0.001	0 -.024
Anterior thalamic radiation	Left	0.033	.014-.071
	Right	0.060	.027-.120
Cortico- spinal tracts	Left	0.001	0 -.006
	Right	0.001	0 -.012
Inferior Longitudinal Fasciculus	Left	0.005	0-.026
	Right	0.002	0 -.009
Uncinate Fasciculus	Left	0.008	.002-.017
	Right	0.012	.003 -.031
Cingulum^	Left	0.003	0 - .130
	Right	0	0- .008
Corpus Callosum	Frontal	.032	.014,.069
	Occipital	.017	.001, .082

^ *Upper and lower portions of the Cingulum are reported combined.*

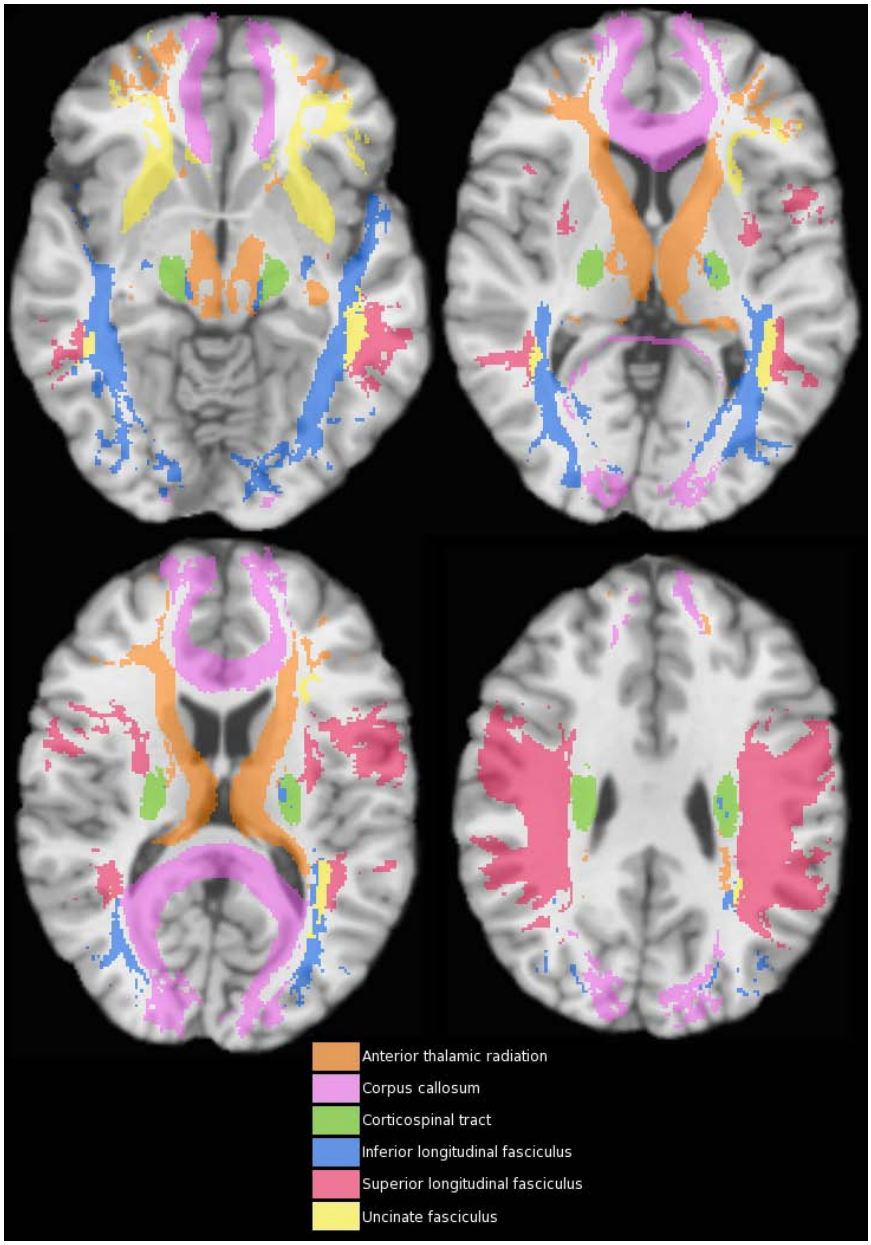

Figure S1.

Figure Legend

Figure S1. Axial views of white matter tracts of interest are illustrated in color overlays on a T1-weighted MPRAGE in standard space (Montreal Neuroimaging Initiative).