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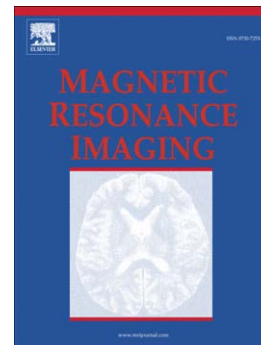
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Roman Fleysheer, Michael L Lipton, Olga Noskin, Tatjana Rundek, Richard Lipton, Carol A. Derby

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White Matter Structural Integrity and Trans-Cranial Doppler Blood Flow Pulsatility in Normal Aging

Roman Fleysher^{a,b,*}, Michael L Lipton^{a,b,c,d}, Olga Noskin^e, Tatjana Rundek^h,
Richard Lipton^{e,f}, Carol A. Derby^{e,f}

^a*The Gruss Magnetic Resonance Research Center,*

^b*Department of Radiology,*

^c*Department of Psychiatry and Behavioral Sciences,*

^d*The Dominick P. Purpura Department of Neuroscience,*

^e*Saul R Korey Department of Neurology,*

^f*Department of Epidemiology and Population Health,*

Albert Einstein College of Medicine and Montefiore Medical Center, Bronx, NY, United States

^g*Neurology Group of Bergen County, P. A., Ridgewood, NJ, United States*

^h*Departments of Neurology and Public Health Sciences, University of Miami Miller School of Medicine, Miami, FL, United States*

Abstract

Cerebrovascular diseases underlie many forms of age-related cognitive impairment and the mechanism linking the two is hypothesized to involve adverse changes in white matter (WM) integrity. Despite being systemic, small vessel disease does not uniformly affect WM. We performed voxel-wise analysis of MRI images to examine the association between fractional anisotropy (FA) — a diffusion tensor measure of WM structural integrity — and pulsatility index (PI) — a transcranial Doppler ultrasound measure of abnormal arterial flow — in adults over the age of 70 years who were free of stroke and dementia. We demonstrate that the relation of PI to microstructural changes in WM is artery specific and regional. We identified spatial clusters of significant correlations between elevated PI and reduced FA which can not be explained by aging, supporting a vascular hypothesis of WM injury. These areas are not limited

*Corresponding author

Email addresses: Roman.Fleysher@einstein.yu.edu (Roman Fleysher), Michael.Lipton@einstein.yu.edu (Michael L Lipton), onoskin@neurobergen.com (Olga Noskin), TRundek@med.miami.edu (Tatjana Rundek), Richard.Lipton@einstein.yu.edu (Richard Lipton), Carol.Derby@einstein.yu.edu (Carol A. Derby)

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