



## AAN 72<sup>nd</sup> ANNUAL MEETING ABSTRACT

Media Contacts:

Renee Tessman, [rtessman@aan.com](mailto:rtessman@aan.com), (612) 928-6137

Michelle Uher, [muher@aan.com](mailto:muher@aan.com), (612) 928-6120

**EMBARGOED FOR RELEASE UNTIL 4 P.M. ET, THURSDAY, MARCH 5, 2020**

**Abstract Title:** Leisure Time Physical Activity and MRI-based Brain Measures in a Multi-ethnic Elderly Cohort

**Press Release Title:** Walking, Gardening, Swimming, Dancing May Prevent Brain Shrinkage in Older Adults: Exercise May Slow Brain Aging by 4 Years

**Authors:** Yian Gu<sup>1</sup>, Jennifer Manly<sup>1</sup>, Nicole Schupf<sup>1</sup>, Richard Mayeux<sup>1</sup>, Adam Brickman<sup>1</sup>

<sup>1</sup>Columbia University, New York, NY

**Objective:** To examine the association of Leisure time physical activity (LTPA) and MRI-assessed brain aging measures in the Washington/Hamilton Heights-Inwood Columbia Aging Project study, a community-based, multi-ethnic elderly cohort.

**Background:** LTPA has been shown to be protective against cognitive decline, dementia, and Alzheimer's disease. However, data on the association between LTPA and brain MRI measures remain scarce.

**Design/Methods:** In this cross-sectional study of 1557 older adults, current LTPA level was measured using metabolic equivalent of energy expenditure from self-reported current LTPA. Total brain volume (TBV), total gray matter volume (TGMV), total white matter volume (TWMV), and white matter hyperintensity volume (WMHV) were derived from MRI scans with established methods and were adjusted for intracranial volume. We examined the association of LTPA with these imaging markers using regression models adjusted for demographic, clinical, and vascular risk factors.

**Results:** The participants of the study had a mean (SD) age of 74.9 (6.0) years, 11.4 (4.9) years of education, and BMI of 28.4 (7.9) kg/m<sup>2</sup>; 994 (64%) were women; 26%, 34% and 38% were non-Hispanic whites, African-Americans, and Hispanics, respectively; and 28% carried Apolipoprotein E4 allele. Compared to those in the lowest tertile of LTPA, those with the highest tertile of LTPA had larger (in cm<sup>3</sup>) total brain volume (b=12.17, p=0.001; p-trend=0.001), total gray matter volume (b=7.18, p<0.0001; p-trend=0.001), and total white matter volume (b=6.82, p=0.005; p-trend=0.005) after adjusting for age, sex, race/ethnicity, education, Apolipoprotein E4 status, intracranial volume, and recruitment waves. The effect size comparing the highest to the lowest tertile LTPA



was equivalent to about 3 years of aging (b for 1-year older=-3.09, -2.44, and -2.12 for total brain, gray matter, and white matter volumes, respectively). The associations were attenuated slightly but remained similar after further adjusting for body mass index and vascular comorbidities. There was no association of LTPA with WMHV. The results remained similar after excluding 296 participants with mild cognitive impairment.

**Conclusions:** More physical activity is associated with larger brain volume in the elderly, supporting further examination of whether higher physical activity level through life course can help protect against brain volume loss.

**Study Supported By:** PO1AG007232, R01AG037212, RF1AG054023, R01AG059013, AG060156, AG054520  
(Government-sponsored grants)