psychological support. Participants' physical function was assessed over 12 years through changes in walking speed (m/s) and chair stand time (s). Linear mixed models adjusted for socio-demographic and clinical factors were used. Subjects with high adherence to Mediterranean diet were <78 years (82.3%), women (56.1%), married (61.1%), with university education (52.8%), high levels of social support (39.3%) and health-enhancing physical activity (51.5%). One-point (over nine) increase in the MDS was associated with a slower annual worsening in walking speed (β*time=0.001; p=0.024) and chair stand time (β*time=-0.014; p=0.008). The protective effect of Mediterranean diet was highest among subjects reporting high social support (β*time=-0.065, p=0.026 for chair stands) and high physical activity (β*time=0.010, p=0.001 for walking speed), beyond the effect of each exposure individually. A higher adherence to Mediterranean diet, especially in combination with recommended levels of physical activity and high social support, contribute to delay the decline in physical function observed with aging.

REGIONAL MICROSTRUCTURAL INTEGRITY IN RELATION TO GAIT SPEED: THE ATHEROSCLEROSIS RISK IN COMMUNITIES STUDY

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Brain imaging-based biomarkers of neuropathology are associated with mobility in older adults, but the relation of regional microstructural integrity to gait speed in the context of a broader neuropathological profile is less understood. We examined cross-sectional associations of microstructural integrity with 4-meter usual-pace gait speed (cm/s) in a subsample of ARIC study participants who completed 3T MRI brain scans with diffusion tensor imaging(2011-13; n=1785; mean age=76.2±5.3, 60% Female, 28% Black). We considered total brain and six regional averages of fractional anisotropy (FA; lower=worse microstructural integrity) and mean diffusivity (MD; higher=worse microstructural integrity): frontal, temporal, parietal, occipital, anterior and posterior corpus callosum. Associations were tested in multivariable linear regression models adjusted for demographics, cardiovascular risk factors, and with and without additional neuropathological indices: total brain volume, white matter hyperintensities, infarcts, and microhemorrhages. When modeled separately, all neuropathology indices were associated with slower gait speed. Every standard deviation(SD) higher total brain FA was associated with +2.56 cm/s gait speed (95%CI: 1.64,3.48) and every SD higher MD was associated with -4.27 cm/s gait speed (-5.34,-3.20). All regional estimates were comparable. When adjusted for all other neuropathology indices, only posterior corpus callosum FA (β=1.72; 0.67,2.77), total MD (β=-1.63; -3.02,-0.25), frontal lobe MD (β=-1.76; -3.03,-0.48), and temporal lobe MD (β=-1.40; -2.78,-0.02) remained significantly associated with gait speed. Microstructural integrity is an informative measure of brain pathology in relation to mobility, with regional measures tied to executive, memory, and somatosensory function being more informative when a broader neuropathological profile is considered.

THE CORTICAL DYNAMICS OF DUAL-TASK STANDING IN OLDER ADULTS

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In older adults, the extent to which performing a cognitive task when standing diminishes postural control is predictive of future falls and cognitive decline. The cortical control of such "dual-tasking," however, remains poorly understood. Electroencephalogram (EEG) studies have demonstrated that the level of attention and cognitive inhibitory activity during cognitive task performance can be quantified by changes in brain activity in specific frequency bands; namely, an increase in theta/beta ratio and a decrease in alpha-band power, respectively. We hypothesized that in older adults, dual-tasking would increase theta/beta ratio and decrease alpha-band power, and, that greater alpha-band power during quiet standing would predict worse dual-task performance. To test this hypothesis, we recorded postural sway and EEG (32-channels) in 30 older adults without overt disease as they completed trials of standing, with and without verbalized serial subtractions, on four separate visits. Postural sway speed, as well as absolute theta/beta power ratio and alpha-band power, were calculated. The theta/beta power ratio and alpha-band power demonstrated high test-retest reliability during quiet and dual-task standing across visits (intra-class correlation coefficients >0.70). Compared with quiet standing, dual-tasking increased theta/beta power ratio (p<0.0001) and decreased alpha-band power (p=0.002). Participants who exhibited greater alpha-band power during quiet standing demonstrated a greater dual-task cost (i.e., percent increase, indicative of worse performance) to postural sway speed (r=0.3, p=0.01). These results suggest that in older adults, dual-tasking while standing increases EEG-derived metrics related to attention, and, that greater cognitive inhibitory activity during quiet standing is associated with worse dual-task standing performance.