

ASSOCIATION BETWEEN DUAL-TASK GAIT AND COGNITIVE FUNCTION IN OLDER ADULTS

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Community mobility involves walking with physical and cognitive challenges. In older adults (N=116; results here from initial analyses: N=29, Age=75±5 years, 51% females), we assessed gait speed and smoothness (harmonic-ratio) while walking on even and uneven surfaces, with or without an alternate alphabetizing dual-task (ABC). ANOVA assessed surface and dual-task effects; Pearson correlations compared gait with global cognition and executive function composite z-scores. The four conditions (even, uneven, even-ABC and uneven-ABC) affected speed(m/s) (0.97±0.14 vs 0.90±0.15 vs 0.83±0.17 vs 0.79±0.16). Smoothness (2.19±0.48 vs 1.89±0.38 vs 1.92±0.53 vs 1.7±0.43) was affected by only surface (controlled for speed). Greater speed was associated with better global cognition(ρ=0.47 to 0.49, p<0.05) for all conditions and with better executive function for even-ABC(ρ=0.39, p=0.04) and uneven-ABC(ρ=0.40, p=0.03). Executive function was associated with smoothness during even(ρ=-0.42, p=0.03) and uneven(ρ=-0.39, p=0.04) walking. Type of walking challenge differentially affects gait quality and associations with cognitive function.

COGNITION MODERATES THE RELATIONSHIP BETWEEN HEARING AND MOBILITY IN COGNITIVELY NORMAL OLDER ADULTS

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Recent data has shown a consistent but modest association between hearing impairment and poor mobility; both are strongly associated with cognition. Cognitive function may moderate the relationship between hearing and mobility. We analyzed 601 cognitively normal older participants from the Baltimore Longitudinal Study of Aging who had concurrent data on cognition (attention, executive function, sensorimotor function), hearing (pure-tone average, PTA), and mobility (6-meter gait speed, 400-meter time). We performed multivariable-adjusted linear regression to test two-way interactions between each cognitive measure and PTA. There were significant PTA interactions with all cognitive measures on 400-meter time. There was a significant interaction between PTA and sensorimotor function on 6-meter gait speed. Among cognitively normal older adults, poorer hearing is more strongly associated with poor mobility in those with low cognition, especially sensorimotor function.

Future studies are needed to understand how cognition may moderate the relationship of hearing impairment with mobility decline over time.

Session 2110 (Symposium)

MOLECULAR RESILIENCY AND AGING

Chair: Adam Salmon

Resilience is described as the ability to respond to acute forms of stress and recover to normal homeostasis. There is growing evidence that biology of resilience is entwined with the biology of aging. With increasing age, resilience decreases and is a likely contributor to increased morbidity, frailty and susceptibility to death with age. Conversely, increased resilience across numerous physiological markers of function is associated with longevity and healthy aging. The variation in resilience in populations suggests biological and molecular regulatory mechanisms that might provide insight into interventions to improve resilience, healthy aging and longevity. In this session, speakers will provide insight regarding short-term assays of resilience in animal models that prove useful both in delineating these biological mechanisms as well as inform on potential translational models to better understand biological resilience in human populations. The sessions focus is on defining these assays and discussion of the biological relevance each resilience assay in terms of the regulation of aging. The goals of these studies range from identifying potential predictors of individual lifespan within markers of functional resilience to leveraging geroscience to define whether markers of resilience can be modified through interventions to the aging process. Moreover, better understanding of the biology of resilience could assist in defining novel interventions that improve resilience and thereby enhance longevity.

CELLULAR RESILIENCE AS A POTENTIAL PREDICTOR OF LIFESPAN

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The progressive decline of resilience during the aging process across multiple functional systems suggests basic biological mechanisms of regulation. We exploited a primary cell model to identify markers of cellular resilience or the ability of cells in culture to respond and return to homeostasis following acute challenge including metabolic, oxidative, or proteostatic stress. Using primary fibroblasts from minimally-invasive skin biopsies of genetically heterogeneous mice, we are able to determine individual cellular resilience as well as the normal lifespan and healthspan of each donor. Our studies suggest donor age and sex affect cellular resilience and that this measure of resilience can predict functional outcomes in some interventional studies. While longevity studies continue, these studies point to a potential highly important marker of healthspan and longevity as well as a model to delineate the biology of resilience in animal and translational models.

RESILIENCE AS A DETERMINANT OF HEALTHSPAN AND LIFESPAN IN MICE

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Dynamic measures of physical resilience—the ability to resist and recover from a challenge—may be informative