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INFLUENCE OF DUAL-TASK CHALLENGES ON GAIT PERFORMANCE OF OLDER ADULTS WITH COGNITIVE IMPAIRMENT

Yu-Hsiu Chu[1], Meng-Tien Wu[2,3], Ko Chiao[2], I-Cheng Lin[4], Ming-Jang Chiu[5], Pei-Fang Tang[2]*

[1]Department of Physical Therapy and Graduate Institute of Rehabilitation Science, China Medical University, Taichung, Taiwan, ROC
[2]School and Graduate Institute of Physical Therapy, National Taiwan University, Taipei, Taiwan, ROC
[3]Rehabilitation Center, Cardinal Tien Hospital Yunghe Branch, Taipei, Taiwan, ROC
[4]Department of Physical Medicine and Rehabilitation, China Medical University Hospital, Taichung, Taiwan, ROC
[5]Department of Neurology, National Taiwan University Hospital, Taipei, Taiwan, ROC

ABSTRACT

Background and Purpose: Older adults with cognitive impairment often present gait dysfunction. We aimed to comprehensively investigate the influence of dual-task challenges on gait performance in these adults.

Materials/Methods: Eleven subjects with mild Alzheimer's disease (AD) (76.2 ± 6.4 yrs), 10 subjects with mild cognitive impairment (MCI) (72.3 ± 6.9 yrs), and 9 healthy older subjects (71.2 ± 5.6 yr) walked at their comfortable pace on the GaitMatII device for 6 trials each under single- and dual-task (performing serial 7 subtraction while walking) conditions. Comprehensive spatio-temporal gait parameters, including gait velocity, stride length, support base, cadence, double support time, and their stride-to-stride variability were calculated. A two-way (Group x Task) repeated measures ANCOVA, with age as the covariate, was used to examine Group and Task effects on the gait parameters.

Results: The three groups were similar in age, height, and physical activity level ($p > 0.05$). The AD group showed the poorest Mini-Mental State Examination score (21.0), followed by the MCI (25.7), and then by the healthy group (28.4) ($p < 0.001$). From the single- to dual-task conditions, all three groups significantly decreased the stride length, but the MCI and AD groups additionally decreased gait velocity and cadence, and increased the double support time ($p < 0.025$).

Conclusions and Clinical Relevance: Concurrent execution of a secondary cognitive task challenges walking performance of older adults with cognitive impairment to a greater extent than that of healthy older adults. Safety precaution is needed for older adults with cognitive impairment when walking in cognitive-demanding environments.