Decline in Gait Performance Detected by an Electronic Walkway System in 907 Older Adults of the Population-Based KORA-Age Study

Abstract: Background: Gait changes at older ages are a strong predictor of a decline in lower extremity functions. However, large population-based studies assessing gait parameters in various gait tasks are lacking. Objective: We investigated the relationship of age, the use of mobility aids and being fitted with an endoprosthesis with selected gait parameters, assessed in different walking tasks. Methods: In the population-based KORA-Age study, data from 907 men and women aged 65-91 years were obtained using the validated electronic walkway system GAITRite, which quantifies spatiotemporal gait parameters in the measurement range of a 488 × 61 cm walkway mat. Participants completed three walking tasks at different speeds (normal, slow and fast) and a fourth walking task at normal speed with the additional task of counting backwards (dual-task walking). Additionally, the impact of endoprostheses (hip or knee) and mobility aids was assessed. Results: The highest relative age-related decline for velocity was observed during dual-task walking (26.1% for men and 23.4% for women) and for step length during fast walking (20.2 and 14.4%) when comparing participants aged <70 years with those aged ≥85 years. Weaker performances for velocity, cadence and step length were observed among women with knee or hip endoprostheses (fast walking speed) (p < 0.05). Across all walking tasks,
significant differences between mobility aid users and nonusers were observed for velocity and step length among both men and women (p < 0.05). Conclusion: A decline in gait performance is most notable in fast speed and dual-task walking, in age-related endoprosthesis and mobility aid analyses. The marked relative decrease in gait parameters in these difficult gait tasks may be attributed to lacking resources for compensation among the elderly.

Stichworte:
Gait performance; Aging; Gait speed; Mobility aid users; Endoprosthesis; Population-based study

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