Fast Gait Speed as a Fall Risk for Older Adults

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INTRODUCTION

Each year 1 in 3 older adults will experience a fall with many resulting in hip fractures, reducing the functional independence of almost half. In 2015, direct medical costs for falls grossed to $637.5 billion for fatal injuries and $31.3 billion for non-fatal injuries (Burns et al., 2016). Gait speed is a quick and inexpensive method to measure an individual's fall risk. Comfortable gait speed was found to be a prognostic indicator of functional status in community-dwelling older adults (Cesari et al., 2005). It is common practice to measure comfortable gait speed of individuals during routine assessment, but fast gait speed is typically not addressed. Currently, there is a gap in the literature regarding fast gait speed, a simple clinical assessment tool, and its relationship to falls. The purpose of the current study was to examine the association between fast gait speed and falls in community-dwelling older adults and determine its potential utility in falls risk assessment by creating a cut-off score.

METHODS

Research Design

The current study was a cohort study consisting of a one-time data collection point. A Mini Mental State Exam (MMSE) was performed before data collection was initiated for eligibility, followed by a short questionnaire and outcome measures. The questionnaire included past medical history, current medications, and a self-report of falls experienced in the past month (FPM) and falls experienced in the past year (FPY). ***Outcome measures*** included 30-second chair stand to assess LE strength, Falls Efficacy Scale-International (FES-I), Activities-specific Balance Confidence (ABC) Scale, Functional Reach (FR) and gait speed measured on the GAITRite® 12-foot walkway system to measure comfortable and fast gait speed.

Bivariate correlations examined the relationship between fast gait speed and FPM and FPY being categorized as non-faller (falls = 0 or 1) and faller (falls = 2 or more) (Masud & Morris, 2001). Significance was set at 0.05. Additionally, a Receiver Operating Curve (ROC) was calculated for FPM and FPY in order to establish a diagnostic cut-off score for fast gait speed and its ability to predict falls in older adults. The Area Under the Curve (AUC) was calculated for each ROC in order to establish the accuracy of the tests.

Participants

The sample consisted of 60 community-dwelling older adults recruited from the Villages, Florida. The group was 68.3% female with a mean age of 75.2 years. Individuals were excluded if there was a presence of Parkinson's disease, brain tumor, traumatic brain injury; inability to complete testing protocol; a score of less than 24/30 on the MMSE; conditions of the inner ear, brain stem or cerebellum that would cause dizziness or falls; use of psychoactive medications or medications that cause sedation, confusion, or hypotension; or visual impairments that affect the ability to complete activities of daily living.

	Mean	SD
Age	75.2	8.6
MMSE	27.8	1.9
Comfortable Gait Speed (m/s)	1.16	0.30
Fast Gait Speed (m/s)	1.59	0.46
FES-I	24.6	8.2
ABC Scale	82.2	17.4
30-Second Chair Stand	11.5	4.0
Functional Reach	30.6	8.4
Falls per Month	0.10	0.30
Falls per Year	0.20	0.40

Table 1. Group characteristics

Note. MMSE = Mini Mental State Exam. For MMSE, higher scores indicate higher levels of functioning with maximum score of 30. FES-I = Falls Efficacy Scale-International. For FES-I, higher scores indicate a greater fear of falling, with a maximum score of 64. Scores of >23 indicate an increased risk for falling (Delbaere et al., 2010). ABC Scale = Activities-specific Balance Confidence Scale. For ABC Scale, higher scores indicate a higher level of physical functioning, with a maximum score of 100%. A score of <67% indicates older adults at risk for falling and is predictive of future falls (Lajoie & Gallagher, 2004). For the 30-Second Chair Stand test, higher scores indicate greater LE strength. For FR, higher scores indicate increased stability and decreased risk of falling.

RESULTS

FPM and FPY were both significantly correlated to fast gait speed (r=-0.48, p<.001; r=-0.44, p<.001, respectively) indicating that slower gait speed is associated with a higher incidence of falls. ROC revealed the ***optimal cut-off for fast gait speed in community dwelling older adults was 1.7 m/s***, positing that a fast gait speed of less than 1.7 m/s is indicative of fall risk (sensitivity 100%, specificity 57%, AUC .89 for FPM; sensitivity 92%, specificity 63%, AUC .89 for FPY).

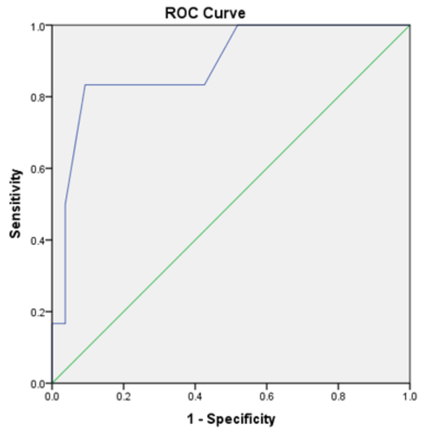

Figure 1. Receiver operating characteristic curve of fast gait speed and FPM; area under the curve (AUC) =0.89 (95% confidence interval (CI)=0.75-1.0)

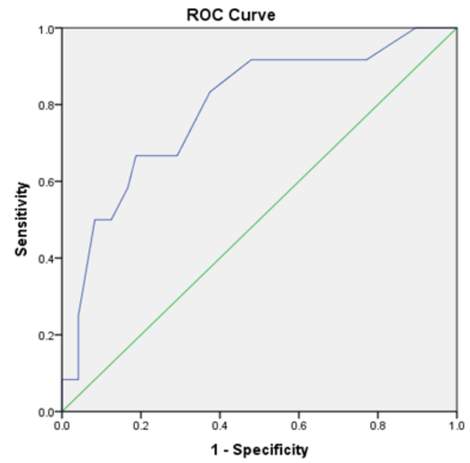

Figure 2. Receiver operating characteristic curve of fast gait speed and FPY; area under the curve (AUC) =0.79 (95% confidence interval (CI)=0.64-0.94)

DISCUSSION

Conclusion

Findings from the current study contribute significantly to the current literature by revealing a significant relationship between fast gait speed and falls in older adults. Additionally, an optimal cut-off score of less than 1.7 m/sec for fast gait speed can be utilized to predict falls in community-dwelling older adults.

Clinical Relevance

Gait speed is a quick and inexpensive objective measurement that can be utilized across all settings and disciplines. This study reveals that fast gait speed is significantly associated with falls in older adults and therefore should be considered when assessing falls risk as well as providing treatment to patients. There are situations in which fast gait speed will be utilized by patients, such as rushing to the bathroom; therefore, a comprehensive treatment strategy should be implemented to incorporate effective therapeutic exercises in order to improve fast gait speed in efforts to reduce risk of falls in community-dwelling older adults.

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