

Gait Metrics Predict 10-year Functional Independence in Early Parkinson’s Disease

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Background and objective

Quantitative gait assessment can reveal subtle impairments early in Parkinson’s disease (PD), before clinically apparent gait disturbance. Long-term functional independence is a clinically relevant outcome. [1,2]

We examined whether gait metrics recorded in early unilateral PD were associated with functional independence after long-term follow-up.

Materials and methods

Sixty-two patients with newly diagnosed unilateral PD underwent GAITRite assessment during usual walking, a motor dual task (carrying water) and a cognitive dual task (serial subtraction of 7).

Gait measures and their variability were analyzed separately for symptomatic and asymptomatic sides. Binary logistic regression examined predictors of favorable outcome.

Results

26

Independent (PD-F)

28

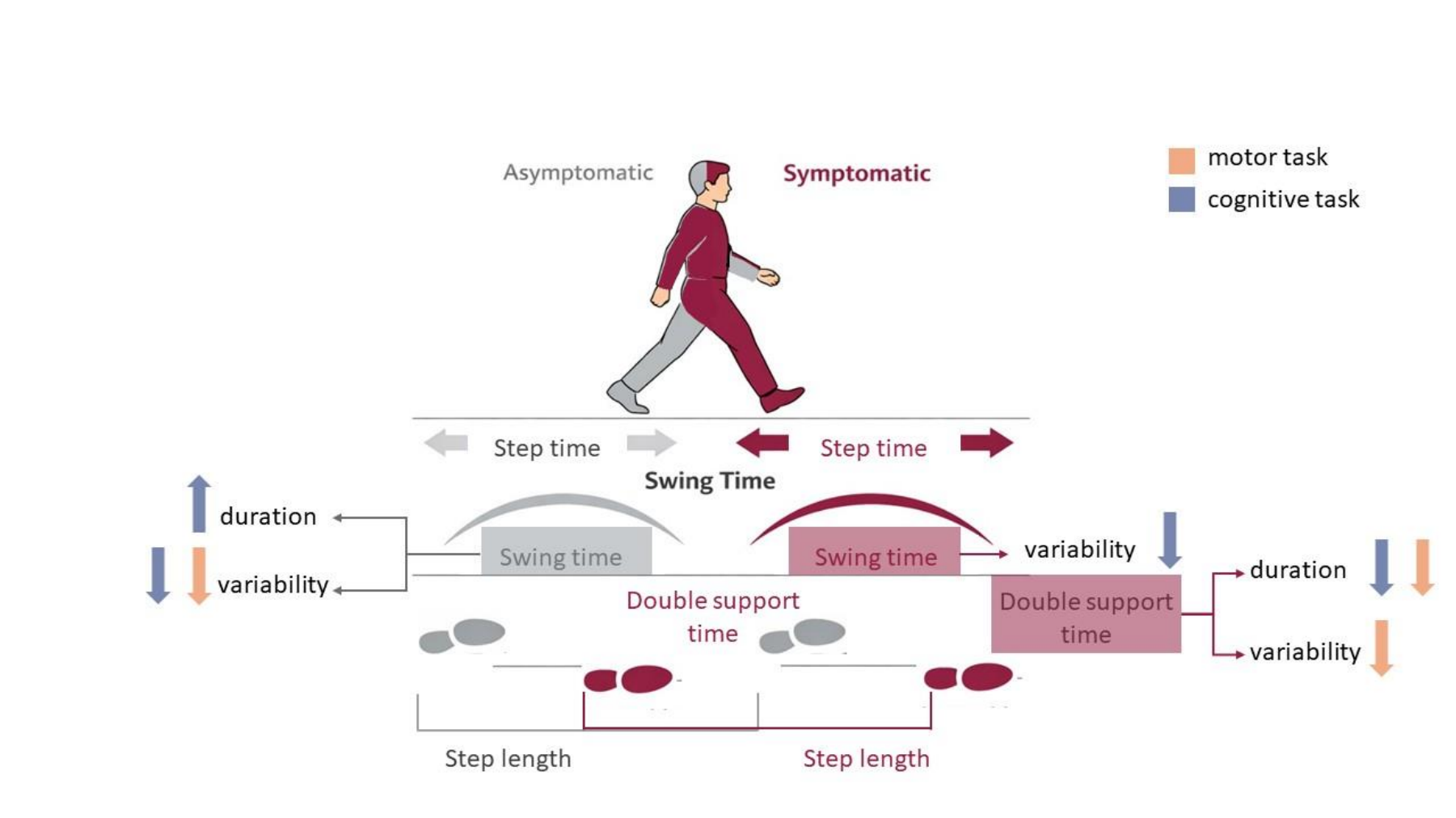
Dependent or deceased (PD-U)

138.9 ± 6.5

Months of follow-up

Eight of 62 patients were lost to follow-up. PD-F patients lived independently without assistance.

Gait predictors of long-term functional independence



Original study figure. Arrows indicate favorable outcome. Orange: motor task; blue: cognitive task.

Between-group differences

PD-F patients were younger (55.2 vs 62.5 years, $p = 0.005$), had more education (13.9 vs 12.5 years, $p = 0.049$) and milder motor impairment (MDS-UPDRS III: 13.7 vs 16.3, $p = 0.018$).

Basic gait did not differ. During the cognitive task, PD-F patients had longer steps and shorter double support time on both sides, with less swing-time variability.

Predictors of favorable outcome

Symptomatic side: shorter double support time (motor $p = 0.029$; cognitive $p = 0.042$), lower double-support variability (motor $p = 0.038$) and lower swing-time variability (cognitive $p = 0.033$).

Asymptomatic side: longer swing time (cognitive $p = 0.028$) and lower swing-time variability (motor $p = 0.008$; cognitive $p = 0.019$).

Conclusion

Dual-task gait metrics may help identify patients with early PD who retain long-term functional independence. Shorter double support time and lower gait variability were associated with favorable outcome, including changes on the clinically asymptomatic side. These findings require validation in larger cohorts.

Selected references

1. Mirelman A et al. Gait impairments in Parkinson’s disease. *Lancet Neurol.* 2019;18:697–708.
2. Macleod AD, Grieve JWK, Counsell CE. A systematic review of loss of independence in Parkinson’s disease. *J Neurol.* 2016;263:1–10.