Physical Performance and Gait in Persons Living with HIV (PLHIV)

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Purpose: To compare physical performance of PLHIV to normative values and explore the impact of peripheral neuropathy on physical performance and gait.

Methods: PLHIV performed the 4-Meter Walk Test (4mWT), the 5 Times Sit-to-Stand Test (5XSTS), the 6-minute Walk Test (6MWT), and the Isometric Mid-Thigh Pull Test (IMTP) to measure gait speed, walking endurance, lower extremity strength, and total body strength, respectively. The 6MWT was conducted on an instrumented walkway to capture temporal and spatial characteristics of gait. Data was analyzed from 70 PLHIV (age 56.2 ± 12.1 years; 35 with neuropathy; 25 women). Z-scores compared physical performance of PLHIV to age and sex-matched normative data obtained from the literature. Average z-scores were compared to the expected score of 0 using a one-sample t-test. We compared performance and gait between participants with and without peripheral neuropathy in the feet using multiple regression adjusting for age, sex, and years with HIV.

Results: On average, PLHIV had a gait speed of 1.00 m/s (0.63 z-score below normative data; $p<0.0001$), walked a distance of 352 meters in 6 min (3.17 z-scores less than expected; $p<0.0001$), and performed the 5XSTS in 12.1 seconds (1.04 z-scores worse than expected; $p<0.0001$). PLHIV produced an average of 10.5 N/kg of bodyweight during the IMTP, which was 4.1 N/kg less than expected (mean z-score = -1.02; $p<0.0001$). In participants with peripheral neuropathy, there was less endurance ($p=.04$), less lower extremity strength ($p=.022$) and less total body strength ($p=.038$) compared to those without neuropathy. There were significant differences in gait speed ($p=.01$), step length ($p=.007$), and enhanced gait variability index ($p=.021$) over a 6-minute walk, indicative of impaired gait and higher gait variability in those with neuropathy.

Conclusions: PLHIV had impairments in physical performance compared to normative data. Painful peripheral neuropathy had a compounding negative impact on physical performance and certain characteristics of gait. In PLHIV, deficits in physical performance and/or gait suggest a need for rehabilitation interventions to improve function and reduce the risk of falls, particularly in older adults.