DESCRIPTION: Over 80% of persons with Parkinson's Disease (PD) will eventually experience Freezing of Gait (FOG). People who experience FOG not only have many more falls than people with PD without FOG, but they also exhibit more severe cognitive impairments. These cognitive impairments involve executive function critical for safe mobility and quality of life. Understanding the types of cognitive deficits associated with FOG and their relationship to mobility can yield insights into effective rehabilitation. To bridge this gap, this presentation discusses: 1) the cognitive changes associated with FOG and possible neural underpinnings, 2) how to assess FOG with clinical tools and wearable technology, and 3) possible approaches to ameliorate FOG in the environments that trigger freezing.

Cognitive impairment (D. Peterson): People with PD who freeze exhibit poorer cognition in global assessments such as the Scales for Outcomes in Parkinson’s disease-cognition (SCOPA-COG). However, recent work has begun to identify specific domains in which people with PD exhibit poorer cognitive performance, including response inhibition, attentional control, visuospatial skills, and learning. The physiological changes underlying these cognitive deficits are not fully understood, but may relate to connectivity among the brainstem locomotor areas with the basal ganglia and frontal cortex. Importantly, recent evidence suggests that cognitive training may improve performance on many of these domains. However, there is limited work on whether improvements via cognitive training results in improved mobility performance or whether improvement in mobility improve cognition.

Assessment (F. Horak): Self-reporting freezing with the New Freezing of Gait questionnaire and in-clinic assessments, such as observation of FOG while turning and dual-tasking, are both useful but don’t always agree. Technological advances in wearable technology afford us the opportunity to improve the quantification of gait and severity of FOG both in prescribed tasks and during natural activities with continuous monitoring. Wearable technology is also being tested to provide biofeedback to reduce FOG and provide real-time gait feedback to therapists and patients.

Treatment (M. Studer): The limited research on the effects of physical therapy on FOG supports a two-fold approach:

1) Rehabilitative- through restitutive dual-task and cognitive training; and
2) Compensatory- through education (cuing, awareness and prioritization).

Therapy must take into account the specific environmental influences affecting each person with FOG. For some, FOG is triggered by upcoming sequential motor tasks (turn to sit, pass through doorways, ambulate over a change in flooring) and for others FOG is triggered by a secondary manual, cognitive, auditory, or visual distractions from the environment. Stress from fear of falling and from temporal demands (hurrying to a phone, to cross a street, to the restroom) are among the cognitive/psychological demands that are associated with FOG and must be addressed in therapy.

References

2017 APTA CSM
San Antonio


