Effect of Dual Tasking and Levodopa-induced Dyskinesia on Postural Sway in People with Parkinson's Disease

Parkinson's disease (PD) is a neurodegenerative disorder that results in motor impairments such as gait and balance deficits. Levodopa is one of the most effective drugs in treating the slowness of movement in individuals with PD. However, the long-term use of levodopa in treating PD often causes undesirable involuntary and uncontrollable movements, known as levodopa-induced dyskinesia (LID). LID is a known cause of increased postural sway. Yet, the relative contribution of the body segments often affected by dyskinesia to postural sway is unknown. We aimed to investigate the contribution of different body segments to postural sway in PD for individuals with and without LID. We collected postural sway of the head, trunk, and lumbar segments in 26 people with PD. Each participant performed a postural sway task in single and cognitive dual-task conditions while ON and OFF levodopa. Our data demonstrated that postural sway ratios were increased during dual-task and ON levodopa. We found up to 2.5x and 2x increase in sway at the head compared to the trunk and lumbar, respectively, in individuals with LID compared to those without LID. These findings suggest a lack of inhibitory control prominent in the superior segment (head) of individuals with LID in PD.

Keywords: Parkinson’s Disease, postural sway, Levodopa-induced dyskinesia