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PHOTOGRAMMETRY ANALYSIS OF SIT TO STAND AND THE RELATIONSHIP WITH FUNCTIONAL BALANCE IN PARKINSON'S DISEASE

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ABSTRACT

Purpose and Background: Sit to stand (STS) is a functional task that is fundamental to functional independence and mobility. In people with Parkinson's disease (PD), poor posture, instability, increased co contraction and the subsequent joint stiffness impair functional balance, and therefore the STS transfer. There is paucity in literature regarding the kinematics of STS across the stages of the disease, and its association with functional balance. This study aimed at assessing the STS transfer across the stages of PD, and studying its relationship with functional balance.

Methods: A Cross-sectional study was conducted - 28 individuals with PD (between stage 1 - 3) were recruited through convenience sampling. The participants were videographed using a high-resolution camera while performing the activity of STS and asked to perform the timed up and go (TUG) tests. The video was frozen at three points during the STS motion and the joint kinematics were analysed using the MB ruler software. The data obtained was descriptively analysed to find the trend in movement pattern in every stage of the disease. A one-way ANOVA was used to check for the interstage variance of STS performance. A Pearson's co-relation was conducted to find the strength of association between the speed of STS and kinematics with functional balance.

Results: There was a mild difference in the way Stage 3 performed the STS as compared to stage 1 and 2. Predominantly, these differences were noticed during the first and second phases of the transfer at the knee, hip, pelvis and frankfort plane. However, these intergroup differences were not statistically significant. The mean difference interstage difference of STS time and TUG tests was statistically significant across the stages. The TUG tests negatively corelated with the knee angulations and was positively corelated with the STS duration.

Conclusion: We conclude that the quadriceps function may potentially influence the STS transfer, functional balance, and mobility in individuals with PD. The longer individuals took to complete the STS task, the poorer was their functional balance score, and this presentation worsened as the disease advanced.