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Vestibular Dysfunction in Post-Acute Sequelae of SARS-CoV-2 Infection: A Gait Analysis Pilot Study

Authors : Adar Pelah, Avraham Adelman, Amanda Balash, Jake Mitchell, Mattan J. Pelah, Viswadeep Sarangi, Xin Chen Cai, Zadok Storkey, Gregg B. Fields, Ximena Levy, Ali A. Danesh

Abstract : Introduction: Post-Acute Sequelae of Severe Acute Respiratory Syndrome Coronavirus 2 infection (PASC), or Long COVID, while primarily a respiratory disorder, can also include dizziness, lasting weeks to months in individuals who had previously tested positive for COVID-19. This study utilized gait analysis to assess the potential vestibular effects of PASC on the presentation of gait anomalies. Materials and Methods: The study included 11 participants who tested positive for COVID-19, a mean of 2.8 months prior to gait testing (PP=11), and 8 control participants who did not test positive for COVID-19 (NP=8). Participants walked 7.5m at three self-selected speeds: 'slow,' 'normal,' and 'fast.' Mean walking speeds were determined for each speed and overall range from four laps on an instrumented walkway using video capture. Results: A Z-test at 0.05 significance was used for speed range, 'normal' and 'fast' at the lower tail, and for 'slow' at the higher tail. Average speeds (m/s) were: 'slow' (PP=0.709, NP=0.678), 'normal' (PP=1.141, NP=1.170), 'fast' (PP=1.529, NP=1.821), average range (PP=0.846, NP=1.143). Significant speed decreases between PP and NP were observed in 'fast' (-17.43%) and average range (-29.86%), while changes in 'slow' (+2.44%) and 'normal' (-4.39%) speeds were not significant. Conclusions: Long COVID is a recognized disability (Americans with Disabilities Act), and although it presents variably, dizziness, vertigo, and tinnitus are not uncommon in COVID-19 infection. These results suggest that potential inner-ear damage may persist and manifest in gait changes even after recovery from acute illness. Further research with a larger sample size may indicate the need for providers to consider PASC when diagnosing patients with vestibular dysfunction.

Keywords : gait analysis, long-COVID, vestibular dysfunction, walking speed
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