Oral Communication

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Virtual Reality in Parkinson's Disease Gait Rehabilitation: A Narrative Review

Topic: Virtual Reality

Maria Bonito, Ana Afonso, Filipe Moás, José Couto, Ana Zão, Rodrigo Monteiro, Marta Silva

PRM, ULSSA, Porto, Portugal

BACKGROUND

Parkinson's disease (PD) is a progressive neurodegenerative disorder characterized by motor dysfunction, including gait impairments such as freezing of gait, reduced stride length, and decreased walking speed. These deficits significantly affect patients' mobility and overall quality of life (QoL). Gait rehabilitation is a critical component in managing PD, aiming to improve functional mobility and reduce fall risk. In recent years, virtual reality (VR) has garnered attention in Physical Medicine and Rehabilitation (PMR) as a promising tool to enhance gait training.

This narrative review aims to analyze the application of VR technologies in gait rehabilitation for patients with PD.

METHODS

A literature search was conducted using the PubMed, Cochrane Library, and Scopus databases with the following keywords: Parkinson's disease, PMR, gait rehabilitation, virtual reality, walking recovery. This review includes clinical studies, randomized controlled trials, and systematic reviews focusing on the use of VR for gait rehabilitation in PD. Article selection was based on relevance to PD gait recovery, technological innovation, and methodological rigor.

RESULTS

A systematic review and meta-analysis encompassing 12 randomized controlled trials revealed significant improvements among patients receiving VR-based rehabilitation compared to control groups. Another systematic review analyzed 16 randomized controlled trials reported that VR training led to significant enhancements in step and stride length, balance function and mobility. However, there were no significant effects on the dynamic gait index and gait speed. Additionally, VR rehabilitation demonstrated more substantial effects on QoL, confidence levels, and neuropsychiatric symptoms compared to traditional rehabilitation methods. These findings suggest that VR-based rehabilitation can effectively improve specific aspects of gait and balance in patients with PD, with additional benefits observed in QoL and neuropsychiatric outcomes. Nonetheless, the lack of significant improvements in certain gait parameters indicates the need for further research to optimize VR training protocols and fully understand its therapeutic potential.

CONCLUSION

Virtual reality gait rehabilitation has demonstrated potential in enhancing gait and balance in PD, being associated with increased patient motivation and adherence to therapy. However, there is a need for more high-quality, large-scale studies to confirm these findings and establish standardized protocols for VR-based rehabilitation in PD.

Statement of Disclosures

None

Corresponding Author:
Maria Bonito
PRM, ULSSA, Porto, Portugal
Email: mariainesbonito@gmail.com

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