E-Poster

EP-108

The Impact of Sensor-Based VR Telerehabilitation on Lower Limb Function in Chronic Stroke Patients: A Retrospective Case-Control Study

Topic: Telerehabilitation

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BACKGROUND

Individuals with chronic stroke often experience various impairments, including poor balance, reduced mobility, limited physical activity, and difficulty performing daily tasks. Telerehabilitation (TR) can overcome many challenges of traditional rehabilitation, including geographical and physical barriers, time, costs, and travel. In this retrospective case-control study, we aimed to evaluate the motor and cognitive effects of balance TR training carried out with a sensor-based non-immersive virtual reality system compared to conventional rehabilitation in chronic stroke patients.

METHODS

Twenty chronic post-stroke patients (mean age 57; 60% female) underwent evaluation for inclusion in the analysis through an electronic recovery data system. The patients included in the study were divided into two groups with similar medical characteristics and duration of rehabilitation training. Our rehabilitation protocol consisted of 40 training sessions each lasting around an hour for both groups (i.e., five sessions per week for eight weeks, by our established standard and clinical research protocols. However, the groups differed in the type of rehabilitation approach used. The experimental group (EG, 10 patients) received TR with a sensor-based VR device called VRRS–HomeKit (Khymeia, Padua, Italy). In contrast, control group (CG: 10 patients) underwent conventional home-based rehabilitation, with a physical interaction with the therapist.

RESULTS

At the end of the training, we observed significant improvements in the EG in the 10-meter walking test (10MWT) ($p = 0.01$), Timed-Up-Go Right (TUG R) ($p = 0.02$), Timed-Up-Go Left (TUG L) ($p = 0.01$), and Montreal Cognitive Assessment (MoCA) ($p = 0.009$). On the other hand, in the CG we noticed a statistical improvement only in the cognitive function ($p = 0.008$), but not in the motor outcomes.

CONCLUSION

Our study highlights the potential role of TR in enhancing lower limb function in chronic stroke patients. TR allows patients to train at home under a therapist's supervision and caregiver support, overcoming geographic and economic barriers while potentially promoting accessibility, consistency, motivation, engagement, independence, personalized care, and improved recovery outcomes.

Statement of Disclosures

None

Doi: 10.5606/archisprm.2026.EP-108

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