

Impact of combined cognitive and motor rehabilitation in a virtual reality task: an on-going longitudinal study in the chronic phase of stroke

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ABSTRACT

Stroke is one of the most common causes of acquired disability, leaving numerous adults with cognitive and motor impairments, and affecting patients' capability to live independently. Virtual Reality (VR) based methods for stroke rehabilitation have mainly focused on motor rehabilitation but there is increasing interest towards the integration of cognitive training for providing more effective solutions. In this work we present a VR cognitive and motor training task - the Reh@Task - and the preliminary results from an ongoing one-month longitudinal intervention. We show the results from twelve patients divided in two groups: experimental and control. Both groups were enrolled in conventional occupational therapy, which mostly involves motor training. Additionally, the experimental group performed a specific attention and memory training with the Reh@Task and the control group performed time-matched conventional occupational therapy. This VR-based task consists in performing adapted arm reaching movements and has difficulty progression levels implemented with guidelines from a participatory design study. We assessed the impact of both interventions post-treatment (4-5 weeks) and at 4 weeks follow-up through the Montreal Cognitive Assessment, Single Letter Cancellation, Digit Cancellation, Bells Test, Fugl-Meyer, Chedoke Arm and Hand Activity Inventory, Modified Ashworth Scale and Barthel Index. A within groups analysis revealed significant improvements with respect to baseline in the global cognitive functioning in both groups, but only the patients who used the Reh@Task improved significantly in attention and memory. With respect to the motor domain, the control group showed greater improvements. Nevertheless, both groups improved significantly in the functional recovery of the hand and arm scores, revealing that both interventions had an impact in the use of the hand and arm in the activities of daily living. Overall, results are supportive of the viability of tools that combine motor and cognitive training, such as the Reh@Task.

Full papers will be published in the Conference Proceedings and will be freely available to delegates at the conference and online on September 20, 2016.