ROBOTIC NEUROREHABILITATION IN PATIENTS WITH CHRONIC STROKE: PSYCHOLOGICAL WELL-BEING BEYOND MOTOR IMPROVEMENT.


ABSTRACT

Although gait abnormality is one of the most disabling events following stroke, cognitive, and psychological impairments can be devastating. The Lokomat is a robotic that has been used widely for gait rehabilitation in several movement disorders, especially in the acute and subacute phases. The aim of this study was to evaluate the effectiveness of gait robotic rehabilitation in patients affected by chronic stroke. Psychological impact was also taken into consideration. Thirty patients (13 women and 17 men) affected by chronic stroke entered the study. All participants underwent neurological examination with respect to ambulation, Ashworth, Functional Independence Measure, and Tinetti scales to assess their physical status, and Hamilton Rating Scale for Depression, Psychological General Well-being Index, and Coping Orientation to Problem Experienced to evaluate the Lokomat-related psychological impact before and after either a conventional treatment or the robotic training. During each rehabilitation period (separated by a no-treatment period), patients underwent a total of 40 1 h training sessions (i.e. five times a week for 8 weeks). After the conventional treatment, the patients did not achieve a significant improvement in the functional status, except balance (P<0.001) and walking ability (P<0.01), as per the Tinetti scale. Indeed, after the robotic rehabilitation, significant improvements were detected in almost all the motor and psychological scales that we investigated, particularly for Psychological General Well-being Index and Coping Orientation to Problem Experienced. Manual and robotic-assisted body weight-supported treadmill training optimizes the sensory inputs relevant to step training, repeated practice, as well as neuroplasticity. Several controlled trials have shown a superior effect of Lokomat treatment in stroke patients' walking ability and velocity in particular. Therefore, our preliminary results proved that active robotic training not only facilitates gait and physical function but also the psychological status, even in patients affected by chronic stroke.