EFFECTS OF GAIT TRAINING USING A ROBOTIC CONSTRAINT (LOKOMAT®) ON GAIT KINEMATICS AND KINETICS IN CHRONIC STROKE PATIENTS.

Bonnyaud C, Pradon D, Boudarham J, Robertson J, Vuillerme N, Roche N.
Source: Université Versailles Saint Quentin en Yvelines, EA 4497, CIC-IT 805, APHP Service de physiologie et d’exploration fonctionnelle, Hôpital Raymond Poincaré, 92380 Garches, France. c.bonnyaud@gmail.com.

ABSTRACT

Objective: To evaluate the effects of a 20-min gait training session using the Lokomat® combined with a negative kinematic constraint on the non-paretic limb and a positive kinematic constraint on the paretic limb, on peak knee flexion and other biomechanical parameters in chronic hemiparetic subjects. Design: Preliminary study, before-after design. Subjects: Fifteen hemiparetic subjects. Methods: Subjects were evaluated using 3-dimensional gait analysis before, immediately after the end of the training, and after a 20-min rest period. The positive constraint increased the range of motion of the paretic limb (hip and knee), while the negative constraint reduced the range of motion of the non-paretic limb (hip and knee). Results: Peak knee flexion and other, kinematic, kinetic and spatiotemporal, parameters were significantly improved following the training session. These positive effects occurred predominantly in the paretic limb. Moreover, there was no worsening of biomechanical parameters of the non-paretic limb despite the use of negative constraint on this limb. These effects persisted for at least 20 min following the end of the gait training session. Conclusion: This type of training may be effective to improve gait in hemiparetic patients. A larger investigation of the training programme is justified.