

Background and aim

Walking dysfunction occurs in more than 80 percent of stroke survivors. After applying different techniques of physiotherapy most of the patients are able to recover their walking ability, though this recovery is partial and remaining walking dysfunction does not limit the patient's daily and social activities only in rare cases. In order to restore gait function robot-assisted gait training is being used increasingly. However, according to some authors, the effects of robot-based therapy are comparable to those of regular gait training exercises with no clear advantages. **The aim of research:** To evaluate the effects of different physiotherapy techniques on gait recovery in patients after stroke.

Methods

12 first stroke patients (subacute period, age 55-70 years, muscles strength of affected leg, grade \geq 2-3) who underwent rehabilitation at Palanga Rehabilitation Hospital in 2019, were randomly assigned into two groups. I group received gait training with KinisiForo System; II group - over ground gait training exercises. Duration of research was 3 weeks. Measurements: Manual muscle testing, Postural Assessment Scale for Stroke Patients (PASS), 10 meter walk test (walking speed, gait asymmetry, stride length, step width), Timed "Up and go" test, Berg balance Scale, Wisconsin Gait Scale for assessment of hemiplegic gait.

NB: The authors declare no conflict of interest.

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Results

After 3 weeks of training with KinisiForo the strength of ankle plantar flexion muscles showed more changes than after over ground gait training. Among the group I participants strength of the ankle plantar flexion muscles on the affected side showed an increase of 1.0 score (according Lovett scale) and reached grade - 4.5 scores.

Analyzing results according to PASS scale a bigger improvement in trunk control was found after training with KinisiForo.

Group I also showed bigger changes in stride length, gait asymmetry and walking speed (m/s). After applying KinisiForo stride length increased approximately by 38 cm (in group II the increase was smaller - 18 cm). Analyzing the Group 10-meter walk test data, we found a double increase in walking speed in group I. It changed from 0.31 (m/s) to 0,66 (m/s) after 3 weeks of physiotherapy with KinisiForo. Walking speed in group II also improved with a change of 0.22 m/s.

Summing „Up & Go“ test results between groups, group I patients showed a bigger change in task performance speed- time decreased by about 20 s. Group II patients showed less improvement - 15 s. Berg's balance scale changes between groups differ less. After gait training with KinisiForo Berg's test results improved by 16 points, applying gait training exercises - 12 points.



KINISIFORO The robotic elliptical gait trainer

Symmetrical elliptical motion whilst simultaneously exercise the upper and lower limbs as well as the trunk muscles

Conclusion(s):

Results have shown that after gait training with KinisiForo patients experienced a bigger improvement in gait. End-effector type robot-assisted gait training systems strongly influence changes in propulsion generation during gate cycle. The principle of elliptical motion insures better trunk control and influences change in gait symmetry. The above mentioned factors strongly influence change in walking speed.