

Evaluating robots for improving outcomes in stroke patients

Effective rehabilitative therapies are needed for patients with long-term deficits after stroke.

In this multicenter, randomized, controlled trial involving 127 patients with moderate-to-severe upper-limb impairment 6 months or more after a stroke, we randomly assigned 49 patients to receive intensive robot-assisted therapy, 50 to receive intensive comparison therapy, and 28 to receive usual care. Therapy consisted of 36 1-hour sessions over a period of 12 weeks. The primary outcome was a change in motor function, as measured on the Fugl-Meyer Assessment of Sensorimotor Recovery after Stroke, at 12 weeks. Secondary outcomes were scores on the Wolf Motor Function Test and the Stroke Impact Scale. Secondary analyses assessed the treatment effect at 36 weeks.

At 12 weeks, the mean Fugl-Meyer score for patients receiving robot-assisted therapy was better than that for patients receiving usual care (difference, 2.17 points; 95% confidence interval [CI], -0.23 to 4.58) and worse than that for patients receiving intensive comparison therapy (difference, -0.14 points; 95% CI, -2.94 to 2.65), but the differences were not significant. The results on the Stroke Impact Scale were significantly better for patients receiving robot-assisted therapy than for those receiving usual care (difference, 7.64 points; 95% CI, 2.03 to 13.24). No other treatment comparisons were significant at 12 weeks. Secondary analyses showed that at 36 weeks, robot-assisted therapy significantly improved the Fugl-Meyer score (difference, 2.88 points; 95% CI, 0.57 to 5.18) and the time on the Wolf Motor Function Test (difference, -8.10 seconds; 95% CI, -13.61 to -2.60) as compared with usual care but not with intensive therapy. No serious adverse events were reported.

In patients with long-term upper-limb deficits after stroke, robot-assisted therapy did not significantly improve motor function at 12 weeks, as compared with usual care or intensive therapy. In secondary analyses, robot-assisted therapy improved outcomes over 36 weeks as compared with usual care but not with intensive therapy. (ClinicalTrials.gov number, NCT00372411.)

Lo AC, Guarino PD, Richards LG, et al. Robot-Assisted Therapy for Long-Term Upper-Limb Impairment after Stroke. *New England Journal of Medicine*.362(19):1772-1783.

<http://www.ncbi.nlm.nih.gov/pubmed/20400552>