Outcomes 12 months after a constraint induced movement therapy program were maintained for an additional year

Synopsis


Question: What is the retention of improvements 24 months after a 2-week constraint-induced movement therapy (CIMT) intervention in stroke survivors? Design: Follow-up 24 months after a single blind, cross over, randomised controlled trial of CIMT. This paper reports follow-up data for the intervention group that received CIMT without delay only. Setting: Seven US academic clinical sites. Participants: 106 out of 222 participants with mild to moderate post-stroke impairment who had experienced the stroke in the previous 3 to 9 months. Interventions: CIMT was delivered for two weeks. During the two weeks, participants wore a padded protective mitt that covered their less impaired wrist and hand up to 6 h per day, 5 days per week. The mitt was to be worn for 90% of waking hours. During that time participants did adaptive task practice or repetitive practice of specific tasks, such as grooming or eating, continuously for 15–20 minutes. Contracts with participants and caregivers were used to promote adherence to mitt use. Outcomes: Primary outcomes were function of the paretic upper limb, measured with the Wolf Motor Function Test (WMFT) and the Motor Activity Log (MAL) measured at 12, 12.5, 16, 20, and 24 months. Health-related quality of life, measured with the Stroke Impact Scale (SIS), was a secondary outcome assessed at 12, 16, and 24 months. WMFT is a laboratory-based measure of upper limb motor function that consists of 15 timed movement tasks and two strength-based tasks. The MAL is a structured interview that assesses 30 activities of daily living on a 6-point scale when using the paretic arm. Results: 34% of the participants who received CIMT immediately after allocation had dropped out at 24 months. From month 12 to month 24, the time taken to complete the WMFT did not decline significantly (mean difference 0.32 s longer, 95% CI –3.06 to 3.70). Over the same period, outcomes improved for weight lifted in the WMFT (1.39 kg, 95% CI 0.04 to 2.74) and for WMFT grip strength (4.39 kg, 95% CI 1.86 to 6.91). There were no significant differences in the amount of use in the MAL (0.17, 95% CI –0.04 to 0.38) and how well the limb was used in the MAL (0.14, 95% CI –0.06 to 0.34). Conclusion: Outcomes that had improved significantly 12 months after a 2-week CIMT program were maintained for an additional year.

Commentary

Since the 1990s, CIMT has been examined in several small trials and in the large multisite EXCITE trial (Wolf et al 2006). The results from the EXCITE trial showed significantly greater functional improvement for the CIMT group compared to the control group at 12-months follow-up. The aim of the present study was to evaluate the retention of the treatment effect 24 months after CIMT. The authors conclude that the functional improvements found at 12-months follow-up were retained for an additional year.

In our view, retention of the treatment effect has not been evaluated because there was no comparison against a control group in the present report from this study. In addition, the paper does not define ‘partially analysed’ and ‘changed condition’ in the trial flow diagram, and this may cause bias if some participants’ data were not included in the analysis because their condition had worsened. Finally, the functional ability scale on the Wolf Motor Function Test showed no significant differences between the groups at 12-month follow-up, and it is appropriate to ask why this scale is excluded from the present analysis. In summary, these methodological shortcomings question the validity of the authors’ conclusion.

However, if CIMT is superior to standard treatment in the long run, this might be explained by motor learning mechanisms and corresponding motor network changes, as repetitive use alone is unlikely to induce long-lasting changes in cortical networks (Nudo 2006). This topic should be investigated further.

The optimal time for this treatment to be applied after the onset of stroke is not determined in this report. In the overall EXCITE trial, however, CIMT was given with a one-year delay to the control group. This provides the opportunity to compare the effect of this treatment given at two different time points. We look forward to publication of this comparison. Although a lot of questions remain unanswered about the efficacy of CIMT, the EXCITE trial has renewed the hope for stroke survivors and moved the research of stroke rehabilitation into the area of evidence-based treatments.

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References