Cognitive rehabilitation for executive dysfunction in adults with stroke or other non-progressive acquired brain damage

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Authors' objectives

Background: Executive functions are the controlling mechanisms of the brain and include the processes of planning, initiation, organisation, inhibition, problem solving, self monitoring and error correction. They are essential for goal-oriented behaviour and responding to new and novel situations. A high number of people with acquired brain injury, including around 75% of stroke survivors, will experience executive dysfunction. Executive dysfunction reduces capacity to regain independence in activities of daily living (ADL), particularly when alternative movement strategies are necessary to compensate for limb weakness. Improving executive function may lead to increased independence with ADL. There are various cognitive rehabilitation strategies for training executive function used within clinical practice and it is necessary to determine the effectiveness of these interventions.

Objectives: To determine the effects of cognitive rehabilitation on executive dysfunction for adults with stroke or other non-progressive acquired brain injuries.

Search methods: We searched the Cochrane Stroke Group Trials Register (August 2012), the Cochrane Central Register of Controlled Trials (The Cochrane Library, August 2012), MEDLINE (1950 to August 2012), EMBASE (1980 to August 2012), CINAHL (1982 to August 2012), PsycINFO (1806 to August 2012), AMED (1985 to August 2012) and 11 additional databases. We also searched reference lists and trials registers, handsearched journals and conference proceedings, and contacted experts.

Selection criteria: We included randomised trials in adults after non-progressive acquired brain injury, where the intervention was specifically targeted at improving cognition including separable executive function data (restorative interventions), where the intervention was aimed at training participants in methods to compensate for lost executive function (compensative interventions) or where the intervention involved the training in the use of an adaptive technique for improving independence with ADL (adaptive interventions). The primary outcome was global executive function and the secondary outcomes were specific components of executive function, working memory, ADL, extended ADL, quality of life and participation in vocational activities. We included studies in which the comparison intervention was no treatment, a placebo intervention (i.e. a rehabilitation intervention that should not impact on executive function), standard care or another cognitive rehabilitation intervention.

Data collection and analysis: Two review authors independently screened abstracts, extracted data and appraised trials. We undertook an assessment of methodological quality for allocation concealment, blinding of outcome assessors, method of dealing with missing data and other potential sources of bias.

Main results: Nineteen studies (907 participants) met the inclusion criteria for this review. We included 13 studies (770 participants) in meta-analyses (417 traumatic brain injury, 304 stroke, 49 other acquired brain injury) reducing to 660 participants once non-included intervention groups were removed from three and four group studies. We were unable to obtain data from the remaining six studies. Three studies (134 participants) compared cognitive rehabilitation with sensorimotor therapy. None reported our primary outcome; data from one study was available relating to secondary outcomes including concept formation and ADL. Six studies (333 participants) compared cognitive rehabilitation with no treatment or placebo. None reported our primary outcome; data from four studies demonstrated no statistically significant effect of cognitive rehabilitation on secondary outcomes. Ten studies (448 participants) compared two different cognitive rehabilitation approaches. Two studies (82 participants) reported the primary outcome; no statistically significant effect was found. Data from eight studies demonstrated no statistically significant effect on the secondary outcomes. We explored the effect of restorative interventions (10 studies, 468 participants) and compensative interventions (four studies, 128 participants) and found no statistically significant effect compared with other interventions.

Authors' conclusions: We identified insufficient high-quality evidence to reach any generalised conclusions about the effect of cognitive rehabilitation on executive function, or other secondary outcome measures. Further high-quality research comparing cognitive rehabilitation with no intervention, placebo or sensorimotor interventions is recommended.


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