Cognitive intervention programs for individuals with mild cognitive impairment: systematic review of the literature

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CRD summary
This review of cognitive interventions for people with the amnestic form of mild cognitive impairment showed some statistically significant improvements in objective and/or subjective measures of memory. This review did not appear to use systematic review methods and there were limitations in the included studies, so the conclusions should be treated with caution.

Authors' objectives
To assess the efficacy of cognitive intervention programs that directly targeted cognition in people with the amnestic form of mild cognitive impairment (MCI-A), critically analyse data and methods of the studies and suggest recommendations for improving cognitive interventions in this population.

Searching
MEDLINE, PsycINFO and Current Contents were searched from 1975 to July 2009 for articles published in English or French. Search terms were reported. A manual search of reference lists of identified articles was performed.

Study selection
Studies of any design that assessed the efficacy of cognitive intervention were eligible for inclusion if at least one patient group had MCI-A (diagnosed using Peterson’s criteria) and results for this group were reported.

The included studies recruited participants from the community or medical or research settings (such as memory clinics and day hospitals). All programmes targeted at least one memory system; the most common was episodic memory. Whether or not programmes were applied in a standardised manner was not reported. Eight studies had a control group: two used a no-treatment control; four used waiting-list control; one used no-contact control; and one used non-specific treatment control. More than half of the studies had at least one follow-up at between one and six months and one study had annual follow-ups for more than three years; some studies had no follow-up evaluation. Cognitive interventions varied and were delivered individually or in a group with between one and 60 sessions of 30 to 150 minutes. Most studies used an objective measure of memory and other outcomes such as intelligence, verbal fluency, quality of life and mood.

The authors did not report how studies were selected for the review.

Assessment of study quality
The authors did not assess study validity.

Data extraction
Standardised effect sizes (ES) were calculated, where possible, as the difference between means at the end of training and baseline divided by the standard deviation (SD). Partial eta squared was converted to Cohen's $d$ effect size if appropriate.

The authors did not report how many reviewers performed the data extraction.

Methods of synthesis
Results were presented narratively and in tables.

Results of the review
Fifteen studies were included: five randomised controlled trials (n=2,952), eight before-and-after studies (with or
Objective measures of memory: 44% of the results showed statistically significant improvements at the end of treatment compared with only 12% for other measures of cognition.

Subjective measures of memory: For quality of life, mood or anxiety, 49% of results showed a statistically significant improvement after the cognitive intervention.

Changes between baseline and end of treatment: P values ranged from less than 0.001 for metacognitive sensitivity, memory delayed recall and memory-strategy knowledge to 0.049 for an objective measure of strategies use. Effect sizes ranged from zero (activities of daily living) to more than two (recognition accuracy measure).

Results at end of follow-up (eight studies): P values ranged from 0.001 for satisfaction with occupational performance to 0.05 for perceived control over memory and depression. Effect sizes ranged from zero (strategy use in everyday life) to 2.52 (word list delayed recall). Three studies compared people with MCI-A to those without the condition and found significantly better performance for the MCI-A group for immediate recall of words and delayed recall of the same test; controls had better results for free delayed recall of a stem-completion task, a logical memory delayed recall task, list-memory immediate and delayed recall and text-memory delayed recall with large effect sizes up to 2.13. Three of nine studies that measured quality of life or anxiety/depression reported a statistically significant improvement in the MCI-A group at the end of treatment and one reported a similar improvement at the end of follow-up.

Authors' conclusions
All cognitive interventions tested in the MCI-A population seemed to present some statistically significant improvement in objective and/or subjective measures of memory. However, these results should be considered in the light of the small sample sizes and study designs of the included studies.

CRD commentary
This review was limited to studies published in English or French and did not search for relevant unpublished studies; therefore, it was at risk of language and publication biases. Inclusion criteria were specified for participants and interventions. There was no restriction on study design. The authors did not report whether systematic review methods (more than one person performing the review) were used, so risks of error and bias could not be ruled out. There was no formal assessment of study validity, but the authors commented on some aspects of the studies, such as their small size and the lack of randomised designs. Results were reported mostly in a table. In some cases the presentation of results was confusing as it was not always clear which were benefits of the intervention.

This review did not appear to use systematic review methods and there were limitations in the included studies, so the conclusions should be treated with caution.

Implications of the review for practice and research
Practice: The authors stated that there should be a consensus meeting among all experts working on cognitive training in the MCI-A population to produce guidelines on the design and conduct of programme evaluations and also the formal and specificity of direct measures of training.

Research: The authors stated that further research in the efficacy of combined treatment strategies and studies that combine cognitive and behavioural data with functional cerebral imaging data were needed. The results of this review needed to be validated in a large randomised double-blind placebo-controlled trial using a standardised cognitive intervention and standardised and validated measures of efficacy and tolerability.

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