Cognitive stimulation therapy for people with dementia: cost-effectiveness analysis


Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The study examined the use of cognitive stimulation therapy (CST) in the treatment of dementia. The authors stated that the CST sessions focused on themes, with additional focus on the current day, and encouraged the use of information processing and implicit memory. A choice of activities was available for each session which allowed the facilitator to adapt the session to the characteristics of each group.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients meeting the DSM-IV criteria for dementia who scored between 10 and 24 on the Mini-Mental State Examination (MMSE). The participants had to have some ability to communicate, be able to see and hear well enough to participate in a meaningful assessment, not display behaviour that would make interview impossible (e.g. aggression), and not have a diagnosis of learning disability or current clinical depression. The staff at each facility determined whether they thought patients were too impaired to be included in the study.

Setting
The setting was institutional and tertiary care in London, Essex and Hertfordshire in the UK.

Dates to which data relate
The effectiveness and resource use data related to 2003 and the unit cost data to 2001. The price year was 2001.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The resource use data were gathered prospectively from the same patient sample as that used in the effectiveness study.

Study sample
The parent clinical study has been reported in detail elsewhere (Spector et al. 2003, see ‘Other Publications of Related Interest’ below for bibliographic details). From the pilot study, the authors estimated that a sample size of 64 in each group was required to achieve 80% power to detect a difference in means of two points on the MMSE. Power
calculations were performed assuming a common standard deviation (SD) of 4.0 and using a two-group t-test with a two-sided significance level of 0.05. The sample was selected by contacting centres with at least 8 potential participants. Among those centres that chose to participate, the centre manager and staff identified potential candidates. The authors did not discuss whether the study sample was appropriate for the clinical study question. Among 292 patients screened for inclusion, 91 did not meet the study inclusion criteria or died before full assessment. The study included 201 patients in total, of which only 161 had complete cost data. For those patients with cost data, 91 were in the intervention group and 70 in the control group.

Study design
The study was a single-blind randomised controlled trial conducted in multiple centres. The 23 centres consisted of 18 care homes and 5 day centres. A researcher generated a list of participants in each centre and ordered them alphabetically. This list was passed to the therapist, who was masked to all assessment outcomes, who then drew numbers from a counter selector. The first five numbers that identified participants on the list were assigned to the intervention group, and the remaining participants (range: 3 to 5) were assigned to the control group. The researcher who assessed the patients was blind to treatment allocation.

The groups were followed up for 8 weeks. Eleven patients with complete cost data were lost to follow-up because of death (n=4), illness (n=3), moving away (n=1) and refusing the follow-up assessment (n=3). The authors stated that there were no differences in baseline characteristics between those included and excluded from the economic evaluation.

Analysis of effectiveness
The analysis of effectiveness was conducted on an intention to treat basis for those patients who were randomised, whether or not they took part in the whole programme. The primary health outcome was change in cognition as measured by the MMSE. The secondary outcome was quality of life as measured by the Quality of Life in Alzheimer's Disease (QoL-AD) scale. The authors stated that there were no differences in clinical measures between the intervention and control groups at baseline. The intervention group had a slightly higher mean age (85.7 years versus 84.7 years) and a higher proportion of females (80% versus 75%) compared with the control group.

Effectiveness results
Among the full study sample of 201 patients, there was a significant improvement in MMSE for the intervention group compared with the control group (+1.14; p<0.05) and a significant improvement in the QoL-AD scale (+1.64; p<0.05).

For the sample included in the economic evaluation (i.e. the 161 patients with complete cost data), the mean difference in MMSE was +0.6 for the intervention group compared with the control group, and +1.98 in the QoL-AD scale.

Clinical conclusions
The authors concluded that CST has effectiveness advantages, in terms of cognition and quality of life, over treatment as usual in patients with dementia.

Measure of benefits used in the economic analysis
The measure of benefit used was the change in mean score on the MMSE.

Direct costs
Aggregated levels of service use were reported separately from the costs. The study included the direct costs to the health service and other agencies providing social care. The direct costs included residential care, domestic housing, hospital services, day services, community services, medication and the cost of the intervention (e.g. researchers' time, travel expenses, care assistant time and equipment). The estimation of prices was based on published national figures for England using data from the Personal Social Services Research Unit and the British National Formulary.
Discounting was not relevant as the duration of follow-up was less than one year. The study reported the average costs. The price year was 2001.

**Statistical analysis of costs**
The costs were compared using bias-corrected bootstraps. In addition, an analysis of covariance (ANCOVA) was used to compare the follow-up costs between groups while controlling for non significant differences at baseline. The authors did not specify a significance level. The study was not powered to detect a difference in the costs.

**Indirect Costs**
The indirect costs were not included in the analysis. This was appropriate given the stated study perspective.

**Currency**
UK pounds sterling (GBP). 

**Sensitivity analysis**
The authors conducted a sensitivity analysis around the size of the CST group in order to test the generalisability of the study results. They assumed group sizes of 3 and 7 patients, in comparison with the study group size of 5 patients per CST session.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The mean weekly cost at baseline was 395.19 (SD=110) in the control group and 423.72 (SD=178) in the intervention group. The difference was 28.53, (p=0.241).

The mean weekly cost at follow-up was 368.61 (SD=111) in the control group and 413.80 (SD=151) in the intervention group. The difference was 45.18, (p=0.037).

The difference in follow-up costs was compared using an ANCOVA to control for baseline differences. The resulting p-value was 0.076.

**Synthesis of costs and benefits**
The costs and benefits were combined to calculate the cost per additional point on the MMSE scale and the cost per additional point on the QoL-AD scale.

The intervention group was estimated to cost 75.32 per additional point on the MMSE scale compared with the control group.

The intervention group was estimated to cost 22.82 per additional point on the QoL-AD scale compared with the control group.

A cost-effectiveness acceptability curve was used to show the probability that CST was cost-effective for a range of threshold values of willingness-to-pay for an additional point on the MMSE scale (and QoL-AD scale). The results for the cost-effectiveness acceptability curve were not reported in the text. However, the authors reported that, under reasonable assumptions, there was a high probability that CST was more cost-effective than treatment as usual.

The sensitivity analysis showed that, for a smaller CST group, the incremental cost-effectiveness ratio (ICER) grew to 102 per incremental change in MMSE. For a larger group, the ICER was 63.87 per incremental change in MMSE.
Authors' conclusions
"Taking part in the evidence-based CST (cognitive stimulation therapy) group programme made little difference to the costs for the participants relative to people receiving care as usual, but cognitive outcomes as measured by the MMSE and ADAS-Cog were improved, as was quality of life as measured by the QoL-AD. The estimated cost-effectiveness acceptability curves for both cognitive improvement and quality of life change suggest that decision-makers would be likely to view CST as a comparatively cost-effective option, although costs and outcomes were measured over a relatively short period."

CRD COMMENTARY - Selection of comparators
The comparator was treatment as usual. You must decide whether the usual activities in the care homes and day centres included in the study are representative of treatment as usual in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness data were derived from a single study. A single-blind randomised controlled design was appropriate for the study question. Power calculations, to ascertain whether the results obtained were due to the intervention or to chance, were reported. In addition, the method of randomisation, length of study, loss to follow-up and blinding assessment were all reported, suggesting that the internal validity of the study is likely to be high. The analysis was conducted on an intention to treat basis and extensive statistical analyses were carried out to account for potential biases and confounding factors.

The authors acknowledged that it was not possible to generalise the results to groups other than those who participated in the study (i.e. patients with mild to moderate dementia with some functional hearing and vision).

The economic evaluation did not account for all patients included in the effectiveness study. Although the authors stated that there were no significant differences between those patients included and excluded from the economic evaluation, it is apparent that there were differences in the point estimate of the primary outcome. The authors did not explore alternative approaches for dealing with the missing resource use data.

Validity of estimate of measure of benefit
The estimation of benefits was obtained directly from the effectiveness analysis. The authors acknowledged that the interpretation of the study results is inhibited by a lack of evidence on the society's or health system decision-makers' willingness-to-pay per additional point on the MMSE scale.

Validity of estimate of costs
For the cost perspective adopted (i.e. health and personal social services), it appears that all the relevant categories of cost have been included. The costs were reported separately from aggregated resource use quantities, which may aid the generalisability of the study results. The costs were compared using bias-corrected bootstraps and an ANCOVA. ANCOVA is appropriate for data that are normally distributed, which is not typical of cost data. The unit costs were taken from published sources in the study setting. A sensitivity analysis of the prices was not conducted. The price year was stated, which will aid future inflation exercises. Since the costs were incurred during less than one year, discounting was not relevant.

Other issues
The authors compared their findings with other costing studies that assessed CST. The issue of generalisability to other settings was addressed, including generalisability to patients in different residential locations and the delivery of CST by alternative health care workers. The authors do not appear to have presented their results selectively and their conclusions reflected the scope of the analysis. The study enrolled patients with mild to moderate dementia and this was reflected in the authors' conclusions. The authors acknowledged that the study may have been too small to test the cost-effectiveness hypothesis, and that the follow-up period was relatively short. No further limitations of the study.
Implications of the study
The authors proposed that further studies be conducted to assess the cost-effectiveness of CST in other settings.

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Other publications of related interest

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