Efficacy of a cognitive stimulation therapy programme for people with dementia

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Abstract

Objectives: Cognitive stimulation therapy (CST) has been shown to produce improvements in cognition and quality of life which compare favourably with trials of cholinesterase inhibitors.[1] The aim of the present study was to evaluate the efficacy of CST, replicating the methods of Spector et al in the *British Journal of Psychiatry* in 2003 in a smaller sample using a control group engaged in routine activities.

Methods: Eligible participants (mild to moderate dementia; MMSE range 10-23) were randomised to CST group or control conditions. Pre- and post-intervention testing was undertaken by assessors who were blind to condition. Measures included MMSE, CDR (sum of boxes), ADAS-cog, RAID (anxiety), abbreviated GDS (depression), QoL-AD, and the CAPE Behaviour Rating Scale (BRS). Analysis was by non-parametric statistics. Occupational therapists facilitated two sessions per week for seven weeks in two long-term care facilities and the same programme was run by the activity co-ordinator in a nursing home unit.

Results: Fourteen CST and 13 control participants completed the study. Between group difference scores analysis showed that the CST group improved compared to controls on MMSE (Mann-Whitney U = 32, p = 0.013) and on the QoL-AD which just fell short of significant (U=51.5, p = 0.055). Qualitatively, therapists noted that CST participants demonstrated good interaction and enthusiasm in the group environment, with continuity and carryover between sessions.

Conclusions: Even though the sample sizes are small the current study is consistent with the Spector et al's findings in 2003 of beneficial effects in people with dementia following CST. The programme is recommended as an intervention for people with mild to moderate dementia.

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Introduction

Cognitive stimulation therapy (CST) is a non-pharmacological intervention designed for people with dementia which focuses on improving and strengthening spared cognitive resources and maintaining social and interaction skills. Recent studies and reviews demonstrate that cognitive stimulation interventions have the potential to improve cognitive function and quality of life for people with dementia[1-5] and to enhance the effects of cholinesterase inhibitors.[6-7]

In the UK the National Institute for Health and Clinical Excellence (NICE) recommends that people with mild-to-moderate dementia of all types should be given the opportunity to participate in a structured group cognitive stimulation programme, provided by a range of health and social care staff with appropriate training and supervision, and offered irrespective of any drug prescribed for the treatment of cognitive symptoms of dementia.[8]

In Ireland the Health Information and Quality Authority (HIQA) similarly advocate techniques such as reminiscence and reality orientation to enhance communication and stimulation in dementia-specific residential care units.[9]

Building on pioneering work by Breuil *et al*[10] and using the principals of reality orientation and cognitive stimulation Spector et al[11] devised a cognitive stimulation therapy (CST) programme for people with dementia, and developed a manual for group leaders.[12] They evaluated the efficacy of the programme in a single-blind, multi-centre randomised controlled trial with 201 participants from 18 residential homes and five day centres and found that CST produced improvements in cognition and quality of life which compare favourably with trials of cholinesterase inhibitors.[11] The cost-effectiveness of the programme was evaluated by Knapp et al who concluded that CST is relatively inexpensive and more cost-effective than "treatment as usual".[13]

We were interested to know whether improvements are of such a magnitude as to produce visible benefits to participants in the small group settings within which CST is delivered. Therefore the aim of the present study was to establish whether or not CST is beneficial to participants in terms of cognition and quality of life, using similar evaluation methods to those used by Spector et al contrasting a small sample intervention group and a control group engaged in a range of other routine activities offered in the care settings involved. In the original study "usual activities" had been acknowledged as "doing nothing" for many control participants.

Materials and methods

Ethical approval was obtained from all relevant agencies. Written informed consent was obtained from participants

when possible, or oral consent with countersigned written consent from a next of kin or Senior Ward Nurse who knew the patient well, depending on the circumstances. Participants were recruited from two long-term care facilities linked to St James's Hospital and a private Nursing Home close to Beaumont Hospital.

All agreeable participants were randomly assigned to a CST group or a control group who just continued to participate in routine activities. In all three settings all clients remained active participants in routine activity programmes that they would normally attend run by occupational therapists, physiotherapists (exercise/balance/lower limb groups), speech and language therapists (SONAS – multi-sensory stimulation programmes), or trained activity leaders (eg. bingo, music, art).

All participants also received whatever usual individual therapy programmes they received from occupational therapy, physiotherapy, speech and language therapy and clinical nutrition. Usual occupational therapy groups provided were two to three groups per week; therefore the CST programme reduced the number of occupational therapy groups provided outside of the CST programme.

The CST programme has been described elsewhere.[11] Briefly, CST consists of 14, 45-minute sessions run twice a week over seven weeks. The optimum recommended number of participants in the group is five. By being delivered in a group format it targets psychological and social abilities that influence cognition such as self-confidence, motivation and the feeling of belonging. Cognitive functions are addressed by using practical everyday situations and tasks, such as recognising famous faces, playing word games, reading facial expressions, and discussing relevant themes such as food and money.

Themes include physical games, sound, childhood, food, current affairs, faces/scenes, word association, being creative, categorising objects, orientation, using money, number games, word games, team quiz. Occupational therapists facilitated two sessions per week for seven weeks in the long-term care facilities and the same programme was run by the activity co-ordinator in the nursing home. Inclusion/exclusion criteria were consistent with Spector et al: score between 10-23 on the Mini-Mental State Examination (MMSE).[14] Sufficient ability to communicate and understand communication, as determined by staff who know the client. Adequate hearing and vision to participate in group activities. No major physical illness, disability, or behavioural/psychiatric symptoms that would affect participation. No diagnosis of learning disability.

With the exception of the assessment of depression, for which the present study used the Geriatric Depression Scale (15 item with "do you prefer to stay at home" item omitted[15]) the efficacy of the programme was evaluated using the same measures as Spector et al. In both studies the primary outcome measure was the MMSE. Additional measures included the Alzheimer's Disease Assessment Scale – Cognition (ADAS-Cog),[16] Quality of Life – Alzheimer's disease scale (QoL-AD),[17] Clifton Assessment Procedures for the Elderly – Behavioural Rating Scale, (CAPE-BRS),[18] Clinical Dementia Rating scale (CDR),[19] and Rating Anxiety in Dementia (RAID).[20] All tests were administered by a psychologist, an occupational therapist or psychology graduate not involved in the running of the programme and blind to the participant's group membership (CST or control).

Table 1: Between group pre-intervention comparisons (mean ± std dev, n)

	CST group (five female; nine male)	Control group (nine female; four male)	Mann Whitney U significance
Age	78.4 ± 5.0	81.3 ± 6.2	p = 0.19
MMSE	16.7 ± 5.0, n = 14	17.1 ± 5.1, n = 11	p = 0.66
CDR (sum of boxes)	10.2 ± 2.0, n = 13	11.6 ± 2.6, n = 12	p = 0.04
RAID	8.4 ± 6.5, n = 14	5.3 ± 5.4, n = 12	p = 0.12
GDS-15	4.8 ± 3.9, n = 13	3.6 ± 3.8, n = 13	p = 0.28
QoL-AD	31.6 ± 6.0, n = 14	33.3 ± 7.2, n = 13	p = 0.48
BRS	15.1 ± 4.6, n = 14	14.2 ± 5.6, n = 13	p = 0.59
ADAS-Cog	29.0 ±12.0, n = 13	27.9 ± 9.3, n = 12	p = 0.55

Table 2: Between group pre- to post-intervention changes

	CST group change	Control group change	Between group comparison
MMSE	0.8 ± 3.6	-2.1 ± 2.5	U = 32, p = 0.013
CDR (sum of boxes)	0.5 ± 2.0	0.1 ± 2.1	U = 70.5, p = 0.680
RAID	-1.1 ± 7.3	1.6 ± 6.4	U = 106, p = 0.268
GDS-15	0.9 ± 3.0	-0.1 ± 1.9	U = 64, p = 0.288
QoL-AD	3.6 ± 3.7	0.5 ± 4.4	U = 51.5, p = 0.055
BRS	0.0 ± 3.6	1.4 ± 5.4	U = 106, p = 0.450
ADAS-Cog	-0.2 ±7.2	-2.3 ± 4.1	U = 42, p = 0.387

Statistic methods

As the sample sizes were small, the Mann-Whitney U test (ties included) was used to evaluate between group differences. The pre-intervention scores for both the CST and control groups were compared. Change from pre- to post-intervention was calculated for each variable and the between group difference scores were compared. Difference score = post value – pre value.

Results

Fourteen CST and 13 control participants completed the study. Participants had mild to moderate dementia. *Table 1* shows demographic and pre-intervention between group data. There were more males in the CST group and more females in the control group. Education was almost exclusively to primary level. There were no pre-intervention differences other than the control group being slightly more impaired on the CDR sum of boxes score.

As is evident from *Table 2* the pre- to post- between group difference scores analysis showed that the CST group improved significantly compared to controls on the MMSE,

and an increase on the QoL-AD fell just short of significant ($p = 0.055$).

Of note, the differences on MMSE were evident in the groups, not just due to a couple of individuals. In the CST group the MMSE increased for nine participants, remained the same for two and decreased for three. In the control group the MMSE increased for two participants and decreased for nine participants. Four control and two CST participants were on a cholinesterase inhibitor.

The CST manual permits qualitative ratings which can be completed by the group leader at the end of each session evaluating on five-point scales each participant's interest, communication, enjoyment and mood. There ratings are not blinded, but do provide some additional qualitative information. Ratings were available for the St James's Hospital sites. The group leaders noted that CST participants demonstrated good interaction and enthusiasm in the group environment, with continuity and carryover between sessions. There were difference in ratings between the first and last sessions in that the average scores for participants improved for each of the rated areas. First session averages for interest, communication, enjoyment and mood were 3.89, 3.67, 3.67 and 3.89 respectively. These had increased for the last session to 4.25, 4.25, 4.50 and 4.50 respectively.

Discussion

Even though the sample sizes are very small, the current study is consistent with the Spector et al findings of beneficial effects in people with dementia following cognitive stimulation therapy. Significant benefits were evident on the MMSE (the primary outcome measure), fell just short of statistical significance on the QoL-AD, and group leader ratings of participant interest, communication, enjoyment and mood improved from the first to final session.

The control individuals had continued to participate in the routine activities provided in their respective centres (eg. bingo, music, art), suggesting that it is more than just the activity aspects of CST that underlie the added benefits. Group leaders were of the opinion that regular structured participation in a relatively cohesive group with continuity from session to session may have been an important element. An obvious limitation of this study is the relatively small sample sizes, the findings for which should not be overstated and need to be interpreted with due caution. That said, the findings can reasonably be viewed as encouraging confirmation that CST can produce improvements that are evident even in small group settings.

Another limitation is the fact that while changes were evident on the MMSE these were not seen on the ADAScog, which is a more detailed cognitive evaluation and was also seen to improve in the original study by Spector et al[11] It is not clear why the ADAScog failed to show an effect in the present study but it should be noted that longer tests are not always superior to shorter ones. In a comparison of five mental-status neuropsychological tools including MMSE and some longer instruments Stuss et al[21] found that for dementia screening purposes the short tests, including MMSE, were at least as good as and sometimes better than the longer tests. In their discussion they commented that added length does not necessarily result in higher reliability.

CST potentially fulfils a need for the provision of cognitive stimulation programmes identified both in NICE[8] and HIQA[9] guidelines on care for people with dementia. At a time when budgets are tightening CST offers a potentially cost-effective means of improving the quality of life of individuals with dementia. A manual is available[12] and the programme can be conducted in a variety of settings. There is also potential for longer-term benefits as Orrell et al[22] demonstrated that a once weekly maintenance session can maintain the benefits for at least six months following the initial programme. Our findings add to the evidence that CST is a useful intervention that could be made more widely available to people with mild to moderate dementia.

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