Behavioural management of aggression in dementia: a randomized controlled trial

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Abstract

Objective: to evaluate the efficacy of a brief behaviour management training programme for family carers of patients with dementia and aggressive behaviour.

Design: a randomized controlled trial of a four-session, community-based behaviour management programme. The primary outcome measure was the Rating Scale for Aggressive Behaviour in the Elderly.

Participants: 62 patients with dementia, and their co-resident carers.

Results: there were no significant differences in aggression scores between behaviour management and control groups at follow-up. After adjusting for baseline differences in Rating Scale for Aggressive Behaviour in the Elderly scores, there was a trend towards a reduction in aggressive behaviour in the patients in the behaviour management group compared with those in the control group (F = 3.37, P = 0.071).

Conclusions: this study adds to the small evidence base for the effectiveness of behavioural management strategies in dementia.

Keywords: aggression, behaviour, controlled trial, dementia

Introduction

Physical and verbal aggressive behaviours are among the most common and persistent behavioural symptoms in dementia [1]. They cause great distress to patients and carers, and frequently precipitate hospitalization or institutionalization [2–4]. Behavioural and environmental interventions may play a crucial role in the management of non-cognitive symptoms in dementia [5], although few controlled studies have evaluated their efficacy.

The development of effective non-pharmacological interventions for behavioural symptoms represents an important goal in dementia research, and might help to reduce the current excessive use of neuroleptic drugs to control problematic behaviour in older people [6, 7].

The potential role of behavioural management strategies has been highlighted by two recent controlled trials which demonstrated a reduction in depressive symptoms in both community-dwelling [8] and institutionalized dementia patients [9]. We evaluated a programme within which family caregivers used behavioural techniques to manage aggressive behaviour in dementia patients living at home.

Method

Recruitment of subjects

We recruited patients with dementia and their carers from two old age psychiatry services in Kent. Patients (i) met International Classification of Diseases, revision 10 [10] criteria for dementia; (ii) were resident in the community with their main caregiver; and (iii) were rated by their main carer as at least mildly aggressive, using the global item on the Rating Scale for Aggressive Behaviour in the Elderly (RAGE) [11].

We randomly allocated patients and their carers who met the inclusion criteria to either the behaviour management programme or control group.
Behaviour management programme

A behavioural model of dementia views aggression and other non-cognitive symptoms as arising from an interaction between the disease process and the environment. Although a wide range of behavioural management strategies has been described, two components are considered fundamental [12]: training carers to view behavioural problems in the context of a memory-impairing disease, and identifying factors which precipitate and maintain these problem behaviours.

We developed the behavioural management programme following a review of management guidelines and descriptive studies [5, 13-15]. To optimize the ability of carers and patients to complete the training, the programme was relatively short and was conducted in patients’ homes.

The behavioural management programme consisted of four sessions conducted by one of the authors (N.G.) over an 8-week period. The first session focused on dementia education, in particular the nature of behavioural symptoms in dementia and the impact of environmental factors on behaviour. Carers were asked to provide a clear description of patients’ aggressive behaviours, and were trained to identify precipitating and maintaining factors. The second and subsequent sessions focused on the development of behavioural interventions suggested by the behavioural analysis. Four categories of behavioural interventions were considered:

1. Avoidance or modification of precipitating and maintaining factors, such as inactivity, frequent environmental changes or complex tasks;
2. Use of appropriate communication techniques (e.g. calm approach and adequate explanation before personal care, use of simple one-step commands);
3. Validation or acceptance of false statements or inappropriate requests made by patients;
4. Use of distraction techniques during aggressive episodes.

During the programme, carers who successfully implemented behavioural strategies were encouraged to continue to adopt this approach in the management of future episodes of aggression. When behavioural interventions appeared to be unsuccessful, a further assessment was made of the antecedents and consequences of the target behaviours. If necessary, the interventions were reduced in scope or simplified, and the carer was encouraged to adopt the modified interventions.

Patient and carer assessments

A second author (D.L.), blind to group allocation, assessed patients and carers before the commencement of the behavioural management or control interventions and 2 weeks after completion, using the RAGE [11] and the Behavioural Pathology in Alzheimer’s Disease Rating Scale (BEHAVE-AD) scales to assess behaviour.

The 21-item RAGE scale was the main outcome measure for the study. In the development of this instrument, aggressive behaviour was defined as ‘an overt act, involving the delivery of noxious stimuli to (but not necessarily aimed at) another organism, object or self, which is clearly not accidental’. Seventeen of the items are specific types of behaviour, both physical and verbal, three items represent the consequences of the behaviour, while the final item is a global rating of aggressiveness over the previous 3 days. Although developed for use in an inpatient population, the scale has been shown to correlate closely with the aggressiveness subscale of the BEHAVE-AD in a predominantly community-based sample [14].

BEHAVE-AD is a 25-item clinical rating instrument which tests the characteristic non-cognitive phenomenology encountered in dementia [16]. The scale consists of seven categories: delusional ideation, hallucinations, activity disturbances, aggressiveness, sleep disturbance, affective symptoms and anxiety and phobias. There is also a global severity score of behavioural symptoms.

Cognitive and functional abilities were assessed using the Mini-Mental State Examination [17] and the Blessed Dementia Rating Scale [18], respectively.

Carer burden was measured using the 22-item Zarit Burden Interview [19].

Statistical analysis

We used SPSS for Windows 6.0 for statistical analysis. Twenty-eight patients were required in each group to detect a 50% difference in mean RAGE scores between groups with a two-sided significance level of 5% and 90% power. Continuous data were evaluated by t-tests and analysis of covariance. Categorical data were assessed using χ² tests.

Results

Sixty-five patients met the entry criteria. Three patients dropped out of the trial shortly after their initial assessment: two were admitted to hospital and the third was admitted to residential care. The remaining 62 patient/carer pairs were allocated randomly to either the behavioural management programme (n = 34, 54.8%) or to the control group (n = 28, 45.2%).
**Sample characteristics**

The patients were predominantly women ($n = 37, 59.7\%$), with a mean age of 75.9 (S.D. 5.5, range 66–87) years. Most patients had moderate to severe dementia (mean Mini-Mental State Examination 13.3, SD 6.5; mean Blessed Dementia Rating Scale 13.4, SD 4.5). Aggression scores for the sample were moderately high (mean RAGE 9.2, SD 3.4). Most patients were prescribed at least one psychotropic drug ($n = 36, 58.1\%$), usually a neuroleptic ($n = 25, 40.3\%$).

The main carers were either spouses ($n = 43, 69.4\%$), children ($n = 14, 22.6\%$) or siblings ($n = 5, 8.1\%$) of the patients. Most carers were women ($n = 37, 59.7\%$), with a mean age of 68.5 (SD 12.2; range 39–84) years. There were high levels of caregiver burden within the sample (mean Zarit Burden Interview score 39.0, SD 13.4). There were no significant differences between groups in baseline clinical or demographic characteristics (Table 1).

**Outcome**

All subjects completed the trial and follow-up assessments. There were no significant differences in post-intervention aggression scores between the behavioural management and control groups (RAGE 6.9 and 8.6, respectively; $t = 1.53, df = 60, P = 0.13$). Following adjustment for baseline differences in RAGE scores between groups, using analysis of covariance, there was a trend towards lower RAGE scores in the behavioural management group compared to the control group ($F[1,59] = 3.37, P = 0.071$). On intra-group analysis, there was a significant reduction in RAGE scores for patients in the behavioural management group (Wilcoxon signed-ranks test, $z = -2.5$, two-tailed $P = 0.01$) but not in control group patients. There were no significant differences between groups in the post-intervention BEHAVE-AD, Mini-Mental State Examination, Blessed Dementia Rating Scale or Zarit Burden Interview scores (Table 2). The prescription of psychotropic medication to patients did not alter significantly during the trial.

**Discussion**

This study provides some evidence that behavioural strategies are effective in the management of aggressive behaviour in dementia. The four-session behavioural management programme trained family caregivers in the use of appropriate communication and distraction techniques, and in the identification of factors that precipitated or maintained their relative’s aggressive behaviour. The modest reduction in aggressive behaviour demonstrated in the behavioural management group is likely to be due partly to the methodological limitations of this study, as well as a reflection of the complex and enduring nature of aggressive behaviour in dementia.

The study’s sample size was relatively small, and the behavioural management programme was shorter than most carer-training programmes [20]. The training was conducted by a single therapist, and so lacked the multidisciplinary input which characterizes many training programmes. However, the brief intervention evaluated in this study reflects the type of caregiver training provided by most old age psychiatry services, usually by community psychiatric nurses.

The complex nature of aggressive behaviour in dementia, which is the result of an interaction of neurobiological, psychological and environmental factors, may also have contributed to the programme’s modest impact. Reduced serotonergic function has been linked to impulsiveness and aggression in both non-demented [21] and demented [22] subjects. Evidence has also emerged linking increased central nervous system noradrenaline activity [23] and the preservation of dopaminergic neurones [24] with aggressive behaviour in dementia. Psychological factors also play an important role.

**Table 1. Baseline characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Behaviour management ($n = 34$)</th>
<th>Control ($n = 28$)</th>
</tr>
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<tbody>
<tr>
<td>Patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age, years (SD)</td>
<td>75.6 (5.6)</td>
<td>76.3 (5.3)</td>
</tr>
<tr>
<td>No. (and %) female</td>
<td>22 (64.7)</td>
<td>15 (53.6)</td>
</tr>
<tr>
<td>Mean score (SD)</td>
<td>13.2 (6.7)</td>
<td>13.5 (6.5)</td>
</tr>
<tr>
<td>Mini-Mental State Examination</td>
<td>14.4 (4.8)</td>
<td>12.3 (5.9)</td>
</tr>
<tr>
<td>Mean score (SD)</td>
<td>9.4 (3.8)</td>
<td>8.8 (2.9)</td>
</tr>
<tr>
<td>Behavioural Pathology in Alzheimer’s Disease Rating Scale</td>
<td>8.0 (3.7)</td>
<td>8.0 (4.0)</td>
</tr>
<tr>
<td>No. (and %) taking psychotropic medications</td>
<td>20 (58.8)</td>
<td>16 (57.1)</td>
</tr>
<tr>
<td>Caregivers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean age, years (SD)</td>
<td>68.9 (13.0)</td>
<td>68.0 (11.4)</td>
</tr>
<tr>
<td>No. (and %) female</td>
<td>19 (55.9)</td>
<td>14 (50.0)</td>
</tr>
<tr>
<td>Mean Zarit Burden Interview score (SD)</td>
<td>38.6 (13.9)</td>
<td>39.5 (13.0)</td>
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Emotional responses precipitated by memory loss or failure to complete a task may precipitate an aggressive episode. The likelihood of aggressive behaviour is also increased by coexisting psychopathology. Delusional beliefs have been shown to increase the risk of aggressive behaviour in patients with dementia [14, 25], perhaps by increasing the likelihood that environmental factors, such as the approach of a carer, are perceived as threatening. Aggression in dementia has also been linked to co-morbid depressive symptoms [26]. Finally, adverse environmental factors, such as noise and inadequate access to open space, can also precipitate disruptive behaviours in dementia patients [2]. While some precipitating factors are relatively easy to identify and modify, in other cases the most important precipitants may be internal factors (e.g. pain) which are less readily modified by behavioural strategies.

Failure of the behavioural management programme to reduce carer burden is consistent with previous dementia training programmes that focused mainly on education and support [27, 28]. In addition to the limited scope of the intervention, the advanced stage of the illness process is also likely to have reduced the programme’s impact on carer burden scores, as previous studies have demonstrated that the introduction of successful (but delayed) programmes failed to produce the expected benefits for waiting list patients and their carers [29, 30].

Further research is required to evaluate the role of behavioural management in dementia, and the most effective means of providing family caregivers with training in the management of aggressive behaviour and other non-cognitive symptoms. The cost-effectiveness and long-term impact of caregiver training programmes should also be evaluated. The development of effective non-pharmacological interventions would help to reduce the enormous burden on both patients and their carers. It would also offer, for many patients, an alternative to the use of neuroleptic drugs, which, in addition to their modest efficacy [31], have been linked to a more rapid decline in cognitive function [32]. The results of this study suggest that behavioural strategies are likely to play an important role in effective non-pharmacological interventions in dementia.

**Key points**
- Behavioural strategies may be effective in the management of aggressive behaviour in dementia.
- Caregiver training programmes should include education on the nature of non-cognitive symptoms in dementia, and basic training on the development and implementation of behavioural interventions.
- Behavioural training appears to have little impact on carer burden.

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**References**


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