Effectiveness of nonpharmacological interventions for the management of neuropsychiatric symptoms in patients with dementia: a systematic review

Ayalon L, Gum A M, Feliciano L, Arean P A

CRD summary
This review assessed the effects of non-pharmacological interventions on neuropsychiatric symptoms in patients with dementia. It concluded that unmet needs and behavioural interventions that include caregivers or bright light therapy may be efficacious, but more high-quality research is needed. The review's methods were appropriate and its conclusions are suitably cautious.

Authors' objectives
To assess the evidence base of non-pharmacological interventions for the management of neuropsychiatric symptoms (NPS) in patients with dementia.

Searching
MEDLINE, PsycINFO and the Cochrane Library were searched from 1966 to December 2005; the search terms were reported. Bibliographies were also searched. Only peer-reviewed studies reported in the English language were included.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCT) and single-case designs (SCDs; including those comparing treatments within an individual) were eligible for inclusion.

Eligible RCTs had to fulfil the following criteria from the American Psychological Association's Task Force: clearly stated inclusion and exclusion criteria; reasonable length of follow-up; the determination of clinical as well as statistical significance; use of an agreed treatment manual or standard; evaluation of treatment fidelity; use of a between-group comparison using intention-to-treat analysis; at least 25 participants per arm; clear reporting of drop-outs and treatment refusals.

SCDs had to fulfil the criteria: ABAB design (where A is no intervention and B is an intervention) or multiple baseline designs; continuous assessment with a stable baseline assessment of behaviour (at least 3 data points or predictable variability); standardised NPS assessments; inter-observer agreement data collected; use of appropriate analyses or suitable graphical presentation of results.

Specific interventions included in the review
Studies of non-pharmacological interventions compared with placebo, no treatment, attention control or standard care were eligible for inclusion; studies with additional pharmacological treatment were excluded. The interventions included were an unmet needs intervention (hearing aids), learning and behavioural interventions (functional analysis, cloth barrier, differential reinforcement, and a multi-component intervention combining elements such as functional analysis and contingent reinforcement), caregiving interventions (family visit education programme, caregivers trained in behaviour management, and a combination of caregiver training and an exercise programme for patients), and an environmental/reduced stress-threshold approach (bright light therapy). Control groups, where applicable, received usual care.

Participants included in the review
Studies of patients with dementia were eligible for inclusion. The included patients had various stages of dementia from probable to severe; the majority had Alzheimer's disease or related disorders. The patients were at home, in community dwellings, in day care, in nursing or residential homes, or in a skilled nursing facility.
Outcomes assessed in the review
Studies reporting a reduction in NPS using objective measures with evidence of reliability and validity were eligible for inclusion. The review focused on disruptive behaviours such as agitation, aggression or wandering, and excluded studies that only assessed depression. The outcomes measured in the studies were observations and ratings: hearing aid use; wandering frequency; agitated speech; behaviour counts and behavioural observation by staff; and measures of agitation, behaviour and depression using various disease specific scales such as the Behaviour in Alzheimer Disease scale.

How were decisions on the relevance of primary studies made?
At least two independent reviewers performed the literature searches, with any disagreements resolved by consensus or through consultation with another reviewer.

Assessment of study quality
Only studies that satisfied the outlined design and quality criteria were eligible for inclusion in the review. The authors also commented on some design and analysis aspects of the RCTs, but no further formal validity assessment was undertaken. The validity assessment formed part of the study screening and data extraction procedures and was conducted independently by at least two reviewers.

Data extraction
At least two independent reviewers performed the data extraction, with any disagreements resolved by consensus or through consultation with another reviewer. Data on the study design, inclusion and exclusion criteria, interventions, patients (including severity of dementia), and statistical and clinical significance of the results were extracted.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative structured according to the type of intervention

How were differences between studies investigated?
Differences between the studies were described in the text and tables of the review. The studies were grouped by the type of intervention.

Results of the review
Three RCTs (314 pairs of caregiver and patient) and six SCDs (two studies of a single patient; one each of 4, 5 and 6 patients; and one of 10 caregiver/patient pairs).

Unmet needs interventions.
One SCD of an intervention tailored specifically to the patient found that one or more problem behaviours were statistically significantly improved for all 8 patients after intervention with a hearing aid. The improvement was considered clinically significant.

Behavioural interventions.
All four SCDs found clinically significant improvements in disruptive behaviours after contingency management interventions such as removing rewards, giving rewards for prosocial behaviour, or behavioural redirection. Examples were a 50 to 80% reduction in wandering frequency and a 100% reduction in physical or verbal aggression during the treatment phase.

Caregiving interventions.
At 6 months one trial found a statistical difference of small to medium magnitude for ideational disturbance, irritability, verbal agitation and physical non-aggression after a family visit education programme; the clinical significance was
rated as possible. Another trial found no significant differences between the groups at 6 months' follow-up, but a statistically significant improvement in one or more problem behaviours for all patients in the treatment group immediately after a caregiver training in behaviour management; part of the improvement was considered clinically significant. The third trial found no statistically or clinically significant evidence that caregiver training in behaviour management combined with an exercise programme for patients had any effect on NPS outcomes.

Environmental vulnerability and reduced stress-threshold models.

One SCD that assessed exposure to direct bright light in 6 patients found that agitation scores were significantly lower during light treatment (p<0.001). Although the effects were considered clinically significant, they only lasted for one day after the intervention.

**Authors' conclusions**

Research to date on the effect of non-pharmacological interventions for NPS in patients with dementia indicate that interventions addressing behavioural issues and unmet needs and that involve caregivers or bright light therapy may be efficacious. More high-quality research is needed to confirm these findings.

**CRD commentary**

This review had a clear research question and defined the interventions, outcomes and study designs as part of the inclusion criteria. The search covered a number of databases and also involved manual searches of bibliographies, although only peer-reviewed publications in English were included; this may have led to the introduction of language and publication bias. At least two reviewers independently performed the literature searches and data extraction, thus helping to minimise errors and bias. Only studies that satisfied numerous design and quality criteria were eligible for inclusion, and a considerable number of studies were excluded for not satisfying all the quality criteria.

The narrative summary was appropriate but only limited details of the results were reported. The authors correctly point out that much of the evidence is based on SCD studies of only one or a few patients, so their description of interventions that are 'possibly efficacious' is given with caution. This was a generally well-conducted review and its limited conclusions and recommendations for further research seem reliable based on the evidence presented.

**Implications of the review for practice and research**

Practice: The authors stated that the best current research supports an individualised approach, whereby potential causes of the symptoms are identified and addressed according to behavioural technique. This requires an interdisciplinary team approach and multiple assessments to ensure optimal outcomes.

Research: The authors stated the need for better quality monitoring of the research conducted in this area. Interventions identified as being possibly beneficial need to be studied in either large-scale RCTs or SCDs. Further research should investigate the importance of reducing NPS frequency and perceived ability to manage problem behaviours among staff and family caregivers. There is a need to identify the most feasible outcomes for patients with dementia. Future research should also report on positive outcomes and adverse events.

**Bibliographic details**

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