Multicomponent intervention strategies for managing delirium in hospitalized older people: systematic review
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CRD summary
This review assessed the effectiveness of multi-component intervention strategies for preventing and treating delirium in hospitalised elderly people. The authors concluded that most interventions had the potential to reduce the duration and severity of delirium. However, these conclusions do not appear to be strongly supported by the data presented and a more cautious conclusion may have been more appropriate.

Authors' objectives
To describe the characteristics and assess the effectiveness of multi-component intervention strategies for preventing and treating delirium in hospitalised elderly people.

Searching
MEDLINE, CINAHL, the Cochrane Library and INVERT were searched from January 1966 to August 2003 using the reported search terms. In addition, the reference lists of identified publications were screened for additional studies. Only studies published in English, Dutch, French or German were included.

Study selection
Study designs of evaluations included in the review
Randomised controlled studies (RCTs), controlled studies and before-and-after studies were eligible for inclusion in the review.

Specific interventions included in the review
Studies assessing multi-component intervention programmes aimed at preventing or treating delirium were eligible for inclusion. Studies that assessed programmes concerned with the management of drug or alcohol withdrawal were excluded. The included studies used a variety of intervention components; most included initial assessment by a gerontological nurse specialist, primary nurse or geriatrician/geriatric psychiatrist with follow-up management plans (details were reported).

Participants included in the review
Studies of hospitalised elderly patients (greater than 60 years old) with delirium, defined according to the American Psychiatric Association's DSM criteria (DSM-III, DSM-II-R, DSM-IV and DSM-IV TR) were eligible for inclusion. In all of the included studies, raters involved in determining the diagnosis of delirium were trained; all but one study used the Confusion Assessment Method (CAM) to assess patients. Studies included in the review reported that patients were aged from older than 65 years to older than 75 years. The patients were either orthopaedic patients admitted for surgical repair of a fractured hip or medical patients with prevalent or incident delirium.

Outcomes assessed in the review
Studies assessing the incidence of delirium or change in cognitive functioning were eligible for inclusion. The outcomes reported by studies included in the review were:

- incidence of delirium,
- cognitive functioning (i.e. Short Portable Status Questionnaire, SPMSQ; Mini-Mental State Examination score, MMSE), duration of delirium (i.e. total number of hospital days with delirium, duration of episodes of delirium and total number of hospital days per episode of delirium),
- severity of delirium (i.e. Delirium Index Score, percentage of participants with severe delirium, Crichton Geriatric
Behavioural Rating Scale, Memorial Delirium Assessment Scale and the Modified CAM),

functional status (i.e. percentage improvement at discharge, Katz's Activities of Daily Living (ADL) score and Barthel Index),

mean or median length of stay, and

mortality (i.e. during hospital stay, 8 weeks after admission and 6 months post-discharge).

How were decisions on the relevance of primary studies made?
Two reviewers screened the publications identified in the literature searches and determined whether they met the inclusion criteria.

Assessment of study quality
The validity of the studies was assessed according to the following criteria: randomisation, baseline comparability, identical treatment of study groups with exception of the study intervention, compliance with the intervention, training of raters, blinding of outcome assessment, completeness of follow-up and use of power calculations. Three reviewers independently rated the studies and, after discussion and consensus, awarded each study a maximum of one point for each criterion met. A total score was awarded to each study, ranging from 0 (low quality) to 8 (high quality).

Data extraction
Data were extracted using a specifically designed tool; the authors did not state how many reviewers were involved. The interventions were characterised according to the approach used (either prevention or treatment). Mean or median values were reported for continuous outcomes such as scores on cognitive functioning scales. Percentages were reported for dichotomous outcomes such as mortality. Other outcomes were reported according to the original authors' reports, including risk reductions and Cox Proportional Hazards Ratios (adjusted for age, gender and marital status), with 95% confidence intervals (CIs).

Methods of synthesis
How were the studies combined?
The studies were combined using a narrative summary and data tables.

How were differences between studies investigated?
Differences between the studies were evident from the data tables and the text of the review. Some differences were also discussed within the text of the review.

Results of the review
Three RCTs (n=441), two controlled trials (n=1,122) including one case-matched controlled trial (the review stated three trials, but two trials used the same group of patients and were discussed as one trial throughout the review), and one before-and-after study (n=120) were included in the review.

All three RCTs were awarded the maximum quality score (8 points) and were described as high quality. The case-matched controlled trial scored 6 points, the controlled trial scored 3 points and the before-and-after study scored 4 points.

Incidence of delirium (4 studies). One RCT (n=126) and one case-matched controlled study (n=852) found statistically significant differences in the incidence of delirium during the hospital stay which favoured the intervention group over the control group (relative risk reductions were 36% and 40%, respectively). However, in the case-matched control study, the benefit of the intervention disappeared at 6 months post-discharge. One controlled trial (n=270) and one before-and-after study (n=120) failed to find any statistically significant differences in the incidence of delirium between the intervention and control groups.
Cognitive functioning (2 studies).

One RCT (n=88) failed to find any significant differences between the intervention and control groups with respect to the mean SPMSQ score 8 weeks after admission. The other RCT (n=227) failed to find a significant difference between the intervention and control groups in terms of an improvement in the MMSE score at discharge or 8 weeks after discharge.

Duration of delirium (3 studies).

One RCT (n=126) failed to find any significant differences between the control and intervention groups in terms of the number of hospital days with delirium per episode of delirium. One case-matched controlled trial (n=852) assessing the 'Elder Life Program' found a statistically significant reduction in the total number of hospital days with delirium in the intervention group (105 days) compared with the control group (161 days). One before-and-after study (n=120) also found a statistically significant reduction in the duration of delirium which favoured the intervention (1 day) over the control group (4 days).

Severity of delirium (5 studies).

All five studies used different scales to assess severity. One RCT (n=126) and one before-and-after study (n=120) reported statistically significant improvements in severity in the intervention group as compared with the control group, but two RCTs (n=88 and n=227) and one case-matched controlled study (n=852) reported no significant differences between the two treatment groups.

Functional status (4 studies).

One controlled trial (n=270) showed a statistically significant improvement (change of two or more levels on the Katz ADL scale) in patients in the intervention group as compared with those in the control group; 21% experienced a functional improvement in the intervention group versus 10% in the control group, and only 10% deteriorated in the intervention group as compared with 16% in the control group. The other studies (one RCT, one case-matched controlled study and one before-and-after study) found no significant differences between the intervention and control groups.

Length of stay (6 studies).

No statistically significant differences were found between the intervention and control groups.

Mortality (6 studies).

No statistically significant differences were found between the intervention and control groups.

**Authors’ conclusions**

Most preventive and therapeutic multi-component interventions have the potential to reduce the duration and severity of delirium in elderly hospitalised patients.

**CRD commentary**

This review was based on a clear research question with well-defined inclusion criteria. The literature search appeared reasonable, but relevant data might have been missed by not specifically attempting to locate unpublished data and by only including English, French, Dutch and German publications. More than one reviewer was involved in selecting and assessing the quality of the studies, which reduces the risk of selection bias and errors. It was unclear, however, whether similar steps were taken to reduce errors and bias in the reporting of the data; a specifically designed tool was used to extract the data, which should help to reduce errors and omissions.

Given the variety of study designs and the diversity in study interventions, populations, and in some cases outcome measures, the authors were justified in summarising their findings in a narrative. However, the findings were not
discussed with respect to study quality. The authors’ firm conclusions in favour of the intervention do not appear to be strongly supported by the data presented: the study data were often conflicting and not significant, and the evidence base was relatively small. The authors are, however, justified in recommending further research.

Implications of the review for practice and research
Practice: The authors stated that nurses should play a pivotal role in the prevention, early recognition and treatment of delirium. Once delirium has developed, nursing practice should focus on creating a supporting environment in terms of physical, sensory and interpersonal needs, whilst also managing symptoms and supporting family members.

Research: The authors stated that the interventions assessed in the review need to be studied on a larger scale using broader populations of patients. They also stated that there is a need to determine which components of the multi-component interventions are the most important in terms of feasibility, success rate, adherence and cost-effectiveness. Future studies should also assess the long-term effects of such interventions (e.g. functional recovery and mortality) and the effectiveness of multi-component interventions targeting underlying pathogenic mechanisms (e.g. metabolic and physiological deviations leading to the disruption of neurotransmitter synthesis and function).

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.