Structured analyses of interventions to prevent delirium

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CRD summary
This review concluded that interventions to prevent delirium were effective and that their efficacy was greater when the population incidence of delirium was above 30%. The authors' conclusions may be reliable, but the variable quality and widely differing interventions of the included studies should be borne in mind.

Authors' objectives
To assess the effectiveness of interventions to prevent delirium and to explore the factors which increase the effectiveness of these interventions.

Searching
PubMed, the Cochrane Central Register of Controlled trials (CENTRAL) and CINAHL were searched from 1979 to July 2009. References of relevant articles were checked. Only studies published in English were eligible for inclusion.

Study selection
Controlled studies of adult in-patients (18 year or older) were eligible for inclusion if they evaluated an intervention for the prevention of delirium. Studies of terminally-ill or sedated patients were excluded, as were those that included any patients with delirium at baseline. Eligible studies had to use a definition of delirium that was compatible with the Diagnostic and Statistical Manual (DSM) criteria; the confusion assessment method (CAM) was considered to meet this criterion.

Three-quarters of the included studies enrolled surgical patients; just over half assessed a pharmacological intervention. There was considerable variation in the pharmacological and non-pharmacological interventions assessed. A few studies enrolled only patients at increased risk of delirium. Included patients were aged over 40; most studies had populations with mean ages considerably higher than this.

Two reviewers independently assessed the studies for inclusion in the review. Disagreements were resolved through discussion.

Assessment of study quality
The included studies were assessed for quality using the criteria of the Cochrane Collaboration.

Two reviewers carried out the assessment independently with disagreements resolved through discussion.

Data extraction
Data were extracted on population characteristics, the incidence of delirium and the results of statistical tests of the effectiveness of interventions. Odds ratios (OR) with 95% confidence intervals (CI) were calculated.

Two reviewers independently extracted the data with disagreements resolved through discussion.

Methods of synthesis
A pooled odds ratio with 95% confidence intervals was calculated using a Mantel-Haenszel random-effects meta-analysis.

Subgroups were used to explore the impact of the potential covariates: low versus high incidence of delirium in the control group; pharmacological versus one-component versus multi-component intervention; surgical versus nonsurgical intervention; and risk-based selection versus no selection of patients.

A funnel plot was used to assess potential publication bias.

Results of the review
Sixteen studies were included in the review; ten were randomised controlled trials (RCTs). Sample sizes ranged from 21 to 852. The quality of the studies was variable; studies of pharmacological interventions showed higher quality. Three RCTs used an intention-to-treat analysis. Three RCTs blinded participants, clinicians and outcome assessors. Some studies reported very high losses to follow-up.

The overall pooled estimate showed efficacy of interventions in reducing the incidence of delirium (OR 0.64, 95% CI 0.46 to 0.88). The only covariate that appeared to have an impact on the effectiveness of the intervention was the incidence of delirium in the control group; interventions in studies with a rate of 30% or higher in the control group showed larger effect sizes (OR 0.34, 95% CI 0.16 to 0.71; eight RCTs) than those in studies with lower delirium rates (OR 0.76, 95% CI 0.60 to 0.97; eight RCTs).

One-component non-pharmacological interventions did not show a benefit of intervention, but only two studies assessed these and confidence intervals were wide (OR 1.05, 95% CI 0.09 to 11.57).

There was no evidence of publication bias.

**Authors' conclusions**
Interventions to prevent delirium were effective and appear more effective when the incidence of delirium was 30% or higher.

**CRD commentary**
The review question and inclusion criteria were clear. The search was adequate but the decision to limit the review to published studies reported in English may have increased the chances of selection bias and led to the omission of relevant studies. The authors reported using methods designed to reduce reviewer bias and error at all stages of the review process.

An appropriate assessment of study quality was conducted but was not used to inform the synthesis. The statistical synthesis combined randomised and non-randomised studies with clinically heterogeneous interventions.

The authors' conclusions may be reliable, but the mixed quality and widely differing interventions of the included studies should be borne in mind.

**Implications of the review for practice and research**
**Practice:** The authors stated that, to maximise the options for a cost-effective strategy for delirium prevention, it may be appropriate to offer it to a selected population.

**Research:** The authors did not state any implications for further research

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