Pharmacological management of osteoporosis in nursing home populations: a systematic review

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CRD summary
This review assessed the pharmacological management and medication use for residents with osteoporosis in nursing home populations and concluded that calcium and vitamin D supplementation reduced fracture risk and improves bone mineral density. Shortcomings in the review process and uncertain study quality mean that the authors' conclusions should be interpreted with caution.

Authors' objectives
To assess the benefits of medication for osteoporosis with respect to bone mineral density and fracture reduction in nursing home populations. The authors examined utilisation patterns of osteoporosis medication; this abstract relates to the benefits of medication.

Searching
MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL) and Cochrane Database of Systematic Reviews were searched for English-language studies from 1974 to December 2006; search terms were reported. Reference lists of relevant articles were searched manually and experts were contacted to identify additional articles and research of interest.

Study selection
Studies in nursing home populations that assessed potential benefits of medication with respect to bone mineral density and fracture reduction were eligible for inclusion. Included studies comprised randomised controlled trials (RCT) and cohort and cross-sectional studies. Excluded studies comprised: study populations with a mean age of less than 50 years; community-dwelling adults; combined nursing home population with community-dwelling population; and studies that concentrated on bone turnover markers.

Interventions included variable doses of vitamin D (with or without calcium) and alendronate. Outcomes included changes in bone mineral density and fracture outcomes. Mean patient age across studies was 79 years. For studies that reported potential benefits of medication, between 74% and 100% of residents were women.

Two independent reviewers selected the studies for inclusion. Any disagreements were resolved by discussion.

Assessment of study quality
Study quality appeared to be assessed and the following criteria were reported where appropriate: lack of blinding or placebo, absence of randomisation method details and presence of high drop-out rates.

Data extraction
Changes in bone mineral density or fracture outcomes were extracted for each study.

The authors did not state how many reviewers performed the extraction.

Methods of synthesis
A limited narrative synthesis was reported, supported by tables. Differences between studies were discussed.

Results of the review
Nine studies (eight RCTs) assessed the efficacy of medication (n=8,066, range 18 to 3,270). Duration of follow-up ranged from 18 months to five years for the RCTs.
Reductions in fractures were reported for studies that administered 800IU vitamin D daily (four studies). Studies in which the dose was less than 400IU vitamin D daily did not report significant differences in fracture rates (four studies). Studies with doses of 800IU vitamin D or greater reported small increases (or smaller reductions) in bone mineral density (two studies).

Authors' conclusions
Calcium and vitamin D supplementation were considered to reduce fracture risk and improve bone mineral density, with some support for alendronate.

CRD commentary
The review question was clear and included broad inclusion criteria. A thorough search for English-language publications was undertaken, but it was unclear whether unpublished studies were sought; language bias may have been present and some studies may have been missed. Study selection was undertaken in duplicate. It was not reported how data extraction was undertaken and so it was unclear whether appropriate methods were used to reduce error and bias for this part of the review. Appropriate criteria were used to assess study quality, but the results were not summarised in the publication. Given the heterogeneity across studies, a narrative synthesis was undertaken. In light of the shortcomings highlighted for the review process and uncertain study quality, the authors' conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors stated that all patients in long-term care should be considered for calcium and vitamin D supplementation at doses of 1,200mg and 800IU in the absence of absolute contraindication.

Research: The authors stated that further research was required regarding medication efficacy and safety for osteoporosis in a nursing home population.

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Record Status
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.