A systematic review and economic evaluation of bisphosphonates for the prevention of fragility fractures

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Plain English summary

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Background

Fragility fractures are fractures that result from mechanical forces that would not ordinarily result in fracture, known as low-level (or 'low-energy') trauma. Some patients are at a particularly high risk of fragility fractures.

Aims

We aimed to determine how effective bisphosphonates [alendronic acid (Fosamax® and Fosamax® Once Weekly, Merck Sharp & Dohme Ltd), risedronic acid (Actonel® and Actonel Once a Week®, Warner Chilcott UK Ltd), ibandronic acid (Bonviva®, Roche Products Ltd) and zoledronic acid (Aclasta®, Novartis Pharmaceuticals UK Ltd)] are at preventing fractures, whether or not treatment has any risks for patients and whether or not the clinical benefits are achieved at a reasonable cost.

Methods

We have systematically identified and examined trials that assessed the clinical effects of bisphosphonates. For each clinical outcome, we have combined data from multiple trials to estimate the clinical effectiveness of each bisphosphonate treatment.

We combined data from published sources in an economic model to estimate lifetime costs and clinical benefits for each bisphosphonate and compared these to the estimated costs and clinical outcomes for untreated patients.

Results

All bisphosphonates reduced the risk of vertebral fractures compared with no treatment. For fractures at other sites (e.g. hip and wrist), all of the bisphosphonates reduced the average number of fractures, but for some bisphosphonates we could not exclude the possibility that this was a chance finding. No bisphosphonate was found to be superior to any other at preventing fractures.

Patients taking oral bisphosphonates may experience side effects affecting the stomach and gullet. Patients treated with zoledronic acid may experience flu-like symptoms.

Bisphosphonates taken orally provide greater value for money than those delivered through intravenous infusion. The benefits of bisphosphonate treatment may not outweigh the costs in those with the lowest risk of fracture.
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