

Denosumab, raloxifene, romosozumab and teriparatide to prevent osteoporotic fragility fractures: a systematic review and economic evaluation

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Declared competing interests of authors: Neil Gittoes reports personal fees for being a member of the advisory board to Union Chimique Belge (UCB) S.A. (Brussels, Belgium) and personal fees for contributing to educational meeting sponsored by Eli Lilly and Company (Indianapolis, IN, USA), outside the submitted work. He is also a trustee of the National Osteoporosis Society, a member of the advisory board of the National Osteoporosis Guideline Group and Deputy Chairperson of the Specialised Endocrinology Clinical Reference Group, NHS England.

Published June 2020

DOI: 10.3310/hta24290

Plain English summary

Non-bisphosphonates to prevent fragility fractures

Health Technology Assessment 2020; Vol. 24: No. 29

DOI: 10.3310/hta24290

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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 people are at particularly high risk of fragility fractures. The first treatment used is often a bisphosphonate, but non-bisphosphonate treatments are alternatives.

Aims

We aimed to determine how effective non-bisphosphonates {denosumab [Prolia®; Amgen Inc., Thousand Oaks, CA, USA], raloxifene [Evista®; Daiichi Sankyo Company, Ltd, Tokyo, Japan], romosozumab [Evenity®; Union Chimique Belge (UCB) S.A. (Brussels, Belgium) and Amgen Inc.] and teriparatide [Forsteo®; Eli Lilly and Company, Indianapolis, IN, USA]} 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 non-bisphosphonates. For each clinical outcome, we have combined data from multiple trials to estimate the clinical effectiveness of each non-bisphosphonate treatment.

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

Results

All non-bisphosphonates reduced the risk of vertebral fractures compared with no treatment. For fractures at the hip or at any non-vertebral site, all of the non-bisphosphonates reduced the average number of fractures, but, for some non-bisphosphonates, we could not exclude the possibility that this was a chance finding.

The chance of patients experiencing serious side effects was generally similar regardless of whether patients took non-bisphosphonates, bisphosphonates or placebo (a dummy pill). Blood clots were more common in patients taking raloxifene than in those taking placebo, but these were still a rare outcome (fewer than 1 in 100).

The benefits of denosumab, teriparatide and romosozumab are few compared with their costs. For raloxifene, the risks generally outweigh the benefits. Treatment with bisphosphonates is likely to represent better value for money than treatment with non-bisphosphonates.

ISSN 1366-5278 (Print)

ISSN 2046-4924 (Online)

Impact factor: 3.819

Health Technology Assessment is indexed in MEDLINE, CINAHL, EMBASE, the Cochrane Library and Clarivate Analytics Science Citation Index.

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This report

The research reported in this issue of the journal was commissioned and funded by the HTA programme on behalf of NICE as project number 14/66/01. The protocol was agreed in August 2018. The assessment report began editorial review in July 2019 and was accepted for publication in February 2020. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HTA editors and publisher have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the draft document. However, they do not accept liability for damages or losses arising from material published in this report.

This report presents independent research funded by the National Institute for Health Research (NIHR). The views and opinions expressed by authors in this publication are those of the authors and do not necessarily reflect those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care. If there are verbatim quotations included in this publication the views and opinions expressed by the interviewees are those of the interviewees and do not necessarily reflect those of the authors, those of the NHS, the NIHR, NETSCC, the HTA programme or the Department of Health and Social Care.

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