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Osteoporos Int. 2015 Apr;26(4):1251-60. doi: 10.1007/s00198-014-3007-8. Epub 2015 Jan 9.



Bisphosphonates and their influence on fracture healing: a systematic review.

Molvik H¹, Khan W.

Author information

Abstract

Bisphosphonates are commonly used in osteoporosis, but concerns have been raised about possible negative effects on fracture healing. We systematically reviewed the literature and found that bisphosphonates significantly prolong union times of distal radius fractures but not femoral fractures. The timing of bisphosphonate introduction does not affect fracture union time.

INTRODUCTION: Bisphosphonates are the most commonly prescribed drugs in patients suffering from and at higher risk of developing osteoporosis. However, concerns have been raised as to whether these drugs have a negative effect on fracture healing. The aim of this systematic review is to explore further these concerns.

METHODS: A literature review was performed in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. All relevant articles found via MEDLINE, Cochrane, CINAHL, EMBASE and Google Scholar were screened. Studies with information on bisphosphonates' effect on fracture healing in humans were included and systematically reviewed.

RESULTS: Patients with distal radius fractures on bisphosphonates had a significantly longer union time compared with controls, but not patients with femoral fractures. No correlation between timing of bisphosphonate introduction and union time for fractures was found. Although one study reported a higher humeral non-union associated with bisphosphonate introduction following the fracture, there was no evidence that bisphosphonate introduction, timing or dose resulted in a significant delay in union following other fractures.

CONCLUSIONS: This systematic review has shown that bisphosphonates significantly prolong union times of distal radius fractures. Some clinical findings are in contrast with preclinical studies highlighting the need to develop better animal models to study osteoporosis, treatment and fracture healing. There is also a need for more well-constructed studies looking at the clinical effect of bisphosphonate on fracture healing in a large number of patients. These robust studies need to look at union time and non-union rates as a function of duration and dose of different bisphosphonates in different upper and lower limb fractures.

PMID: 25572046 DOI: [10.1007/s00198-014-3007-8](https://doi.org/10.1007/s00198-014-3007-8)

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