Bisphosphonates to reduce bone fractures in stage 3B+ chronic kidney disease: a propensity score-matched cohort study

Danielle E Robinson,1† M Sanni Ali,1,2† Victoria Y Strauss,1* Leena Elhussein,1 Bo Abrahamsen,3,4 Nigel K Arden,5,6 Yoav Ben-Shlomo,7 Fergus Caskey,8,9 Cyrus Cooper,1,6 Daniel Dedman,10 Antonella Delmestri,1 Andrew Judge,1,11,12 Muhammad Kassim Javaid1,6 and Daniel Prieto-Alhambra1,13

1Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, National Institute for Health Research (NIHR) Biomedical Research Centre, University of Oxford, Oxford, UK
2Faculty of Epidemiology and Population Health, Department of Non-communicable Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK
3Open Patient data Explorative Network (OPEN), Department of Clinical Research, University of Southern Denmark, Odense, Denmark
4Department of Medicine, Holbæk Hospital, Holbæk, Denmark
5Arthritis Research UK Sports, Exercise and Osteoarthritis Centre, University of Oxford, Oxford, UK
6Medical Research Council Lifecourse Epidemiology Unit, University of Southampton, Southampton General Hospital, Southampton, UK
7Population Health Sciences, University of Bristol, Bristol, UK
8School of Social and Community Medicine, University of Bristol, Bristol, UK
9UK Renal Registry, Bristol, UK
10Clinical Practice Research Datalink, Medicines and Healthcare products Regulatory Agency, London, UK
11Musculoskeletal Research Unit, Translational Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK
12National Institute for Health Research (NIHR) Bristol Biomedical Research Centre (BRC), University Hospitals Bristol NHS Foundation Trust, University of Bristol, Southmead Hospital, Bristol, UK
13Grup de Recerca en Malalties Prevelants de l’Aparell Locomotor (GREMPAL) Research Group and Centro de Investigación Biomédica en Red Fragilidad y Envejecimiento Saludable (CIBERFes), University Institute for Primary Care Research (IDIAP) Jordi Gol, Universitat Autonoma de Barcelona and Instituto de Salud Carlos III, Barcelona, Spain

*Corresponding author victoria.strauss@csm.ox.ac.uk
†Joint first authors
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Plain English summary

Rationale and aims

Bisphosphonates are used to prevent fractures in people with fragile bones. People with chronic kidney disease have a high risk of fracturing, but the safety and effectiveness of bisphosphonates in severe chronic kidney disease is unclear. The aim of this study was to assess the benefits (e.g. bone strength improvement and fracture prevention) and the risks of unwanted effects associated with bisphosphonates for people with moderate to severe chronic kidney disease.

Methods

Anonymised primary and secondary care electronic medical records data from the UK NHS were used, as well as a Danish equivalent that included bone density scans.

Anyone in these databases with a measure of reduced kidney function that suggested moderate to severe chronic kidney disease was eligible, which was >220,000 people from the UK. Over 20,000 of them used bisphosphonates. Bisphosphonate users were matched to non-users with similar age, sex and other characteristics.

Results

Bisphosphonate users had a 12% higher risk of their chronic kidney disease getting worse than non-users. Their risks of other side effects, such as acute kidney injuries and gastrointestinal problems, did not change.

Bisphosphonate users had a 25% higher risk of fractures than non-users in the UK database, probably because the matching methods did not create similar-enough groups of users and non-users. However, it was found that bisphosphonate improved bone density in the Danish database. Bone density is a proxy for bone strength, so better bone density should mean fewer fractures.

Conclusions

These results suggest that bisphosphonate therapy may make moderate to severe chronic kidney disease worse. More studies are needed on how bisphosphonates affect milder chronic kidney disease.

Bisphosphonates were associated with better bone strength, but it could not be demonstrated that they reduced fracture risk. More data are required, probably from a placebo-controlled trial, to determine whether or not bisphosphonates prevent fractures in people with moderate to severe chronic kidney disease and whether or not this is worth the risk of their chronic kidney disease worsening.
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This report

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