

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

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Plain English summary

Bisphosphonates for bone fractures in CKD

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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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