EFFECTIVENESS OF ZOLEDRONIC ACID RELATIVE TO OTHER TREATMENTS FOR VERTEBRAL FRACTURES IN OSTEOPOROSIS: RESULTS OF A BAYESIAN MIXED TREATMENT COMPARISON

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OBJECTIVES: To evaluate the efficacy of zoledronic acid relative to other anti-resorptive interventions regarding the prevention of vertebral fractures in postmenopausal women with osteoporosis.

METHODS: Twelve randomized placebo controlled trials investigating the effects of zoledronic acid (1 study), alendronate (3), risedronate (2), ibandronate (1), etidronate (1), calcitonin (1), raloxifene (1), or strontium ranelate (2) in terms of fractures with a follow-up of 3 years (or 2 years if used for registration purposes) were identified with a systematic literature search. The endpoint of interest was morphometric vertebral fractures. Results of all trials were analyzed simultaneously with a Bayesian mixed treatment comparison (MTC). MTC is an extension of traditional meta-analysis by including multiple different pairwise comparisons across the range of different interventions. With MTC the relative treatment effect of one intervention to another can be obtained in the absence of head-to-head evidence. In contrast to a frequentist approach, a Bayesian analysis allows for direct probabilistic inferences. Outcomes were analyzed using a random effects model. RESULTS: There is a 73.6% probability that zoledronic acid shows the greatest reduction in vertebral fractures of all interventions compared, followed by etidronate (23.2% probability) and ibandronate (1.8%). Zoledronic acid showed an OR of 0.28 (95% Credible Interval 0.19-0.40) relative to placebo, an OR of 0.62 relative to etidronate, and an OR of 0.35 relative to ibandronate. Corresponding probabilities that zoledronic acid provides a greater vertebral risk reduction are 99.9%, 79.6%, and 98.9% compared to placebo, etidronate, and ibandronate, respectively. Similar comparisons are under investigation for other fracture endpoints. CONCLUSION: Of the available treatments for osteoporosis, zoledronic acid is one of the treatments that provide greatest fracture risk reductions in general. Furthermore zoledronic acid showed greatest reductions regarding vertebral fractures.