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Title **Glucocorticoid-Induced Osteoporosis: A Systematic Review and Cost-Utility Analysis**

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Aim

To examine the evidence for efficacy in glucocorticoid induced osteoporosis (GIO), model cost effectiveness, and develop a case finding strategy.

Conclusions and results

Various agents are available to treat osteoporosis, and several are licensed for use in preventing and treating GIO. Evidence was found that the bisphosphonate risedronate and calcidiol reduced the incidence of vertebral fracture. The risk of nonvertebral fractures was not decreased. Antifracture efficacy was comparable to the larger experience of bisphosphonates in postmenopausal osteoporosis, and the latter was used for the purposes of health economic modeling. Previous glucocorticoid use was associated with a significantly increased risk of fracture, even after adjusting for bone mineral density (BMD) and prior fracture. In sensitivity analysis, important determinants of cost effectiveness included age and cost of intervention. Cost effectiveness improved markedly by selecting patients according to BMD. The following strategy was considered appropriate in patients receiving long-term glucocorticoids. Patients with a prior fragility fracture would be eligible for treatment, as would individuals aged 75 years or older, irrespective of BMD. At other ages, patients without prior fractures would be eligible for treatment contingent upon a BMD threshold with a T-score of <–2.0 SD. The strategy would demand BMD testing in 73% of patients and identify 47% for treatment.

Recommendations

An assessment algorithm has been devised for case finding in GIO. The algorithm proposed is conservative because of the conservative nature of some of the assumptions that have been made.

Methods

Systematic reviews were undertaken of all randomized controlled studies in which fracture was measured as an outcome. The risk of an osteoporotic fracture in the presence of a prior osteoporotic fracture was computed from a published meta-analysis of the relationship between prior occurrence of fracture and the risk of future fracture. The additional risk due to exposure to glucocorticoids was determined by meta-analysis of prospectively studied, population-based cohorts. This information was used to populate an individual patient-based health economics model.

Further research/reviews required

Intervention thresholds differ substantially from diagnostic thresholds, and should be based on the absolute fracture probability that depends not only on BMD, but also on other independent risk factors. Health economic assessment based on probability of fracture is an important area for further research. Further areas of research arise from gaps in the empirical knowledge on utilities and side effects.

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