COMPARATIVE FRACTURE RISK AMONGST USERS OF DIFFERENT ANTI-OSTEOPOROSIS DRUGS AVAILABLE IN THE UK IN THE NHS : A PROPENSITY-MATCHED COHORT STUDY USING DATA FROM THE CLINICAL PRACTICE RESEARCH DATALINK

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Background

Plentiful evidence is available on the efficacy of anti-osteoporosis drugs (AOD) to prevent fractures in randomized controlled trials [1–4], but there exists a need for data on their comparative effectiveness and safety in NHS actual practice [5, 6].

Objectives

We aim to compare the anti-fracture effectiveness of available AODs based on fracture risk while on treatment in NHS patients.

Methods

A cohort study was conducted including all users of anti-osteoporosis medications registered in the Clinical Practice Research Datalink in 1995–2014.

Study exposure: Use (as defined by GP prescriptions) of alendronate (reference group) compared to other oral bisphosphonates, strontium ranelate, and SERMs. Denosumab and teriparatide were excluded due to low numbers (n = 29 and n = 7 respectively).

Outcomes: Major fractures (hip, spine, wrist, and proximal humerus), hip, and all (except digits and skull/face) non-hip fractures.

Statistics: Multiple imputation was used to handle missing data on co-variables, and propensity score matching (PSM) [7] was performed to minimise confounding. A proportional sub-distribution hazards regression model was used to estimate the risk of fracture with a competing risk of death [8]. Confounders for PSM included age, gender, body mass index, smoking, drinking, fracture/s history, co-morbidities (Charlson index), and concomitant medications (glucocorticoids, anti-coagulants, hormone replacement therapy/contraceptives, aromatase inhibitors, calcium, corticosteroids, heparin, anxiolytics/sedatives).

Results

Data for 163,950 patients was included in the analysis. No significant association was found between fracture(s) and AOD use except for SERM users who appeared to have a reduced fracture risk (Table 1).

Discussion

We found no evidence of differential antifracture effectiveness of different AODs in actual practice. The finding of reduced fracture risk amongst SERM users is likely related to residual confounding due to lack of data on disease severity (i.e. bone mineral density). Table 1. Fracture incidence rate (IR) and relative risk (SHR) amongst different drug users compared to propensity-matched alendronate users.