Oral bisphosphonate use and all-cause mortality in patients with advanced (stage IIIB+) chronic kidney disease: A propensity score analysis

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Background

Chronic kidney disease (CKD) is associated with a significantly increased risk of fractures and mortality. Bisphosphonates, which are highly effective in reducing osteoporotic fractures, havebeen associated with better survival. However, the risks and benefits of oral bisphosphonates (oBP) are unclear in patients with CKD especially in those with stage IV+.

Objectives: To study the association between oBP use and all-cause mortality in stage IIIB+ CKD.

Methods

A population-based cohort study including all subjects with an eGFR < 45/ml/min/1.73 m2 aged 40 years or older, with at least 1 year of run-in data available. Previous and current users of antiosteoporosis drugs other than oBP were excluded. Setting TheSIDIAP (Sistema d'Informació per al Desenvolupament de la Investigació en Atenció Primària) database linked to the Catalan Renal Registry (details on renal replacement therapy), and inpatient records. Exposure oBP prescriptions identified from pharmacy dispensations. oBP use was modelled as a time-varying exposure to avoid immortal time bias. Treatment episodes (in BP users) were created by concatenating prescriptions until patients switched or stopped therapy (refill gap in prescriptions of 180+ days), or were censored (end of study or transfer out) or have died. A washout period of 180 days was added to (date of last prescription +180 days). Main outcome All-cause mortality.

STATISTICAL ANALYSES: Interactions with gender, previous fracture and CKD stage were tested for using multiplicative terms. Propensity scores (PS) were calculated using multivariable logistic regression modelling. Pre-specified predictors of mortality were included in the models. Cox regression models were used to perform adjustment for PS before and after PS trimming (at 5th and 95th percentiles) where 10% of subjects whose PS have little or no overlap were removed.

Results

Out of 86 127 non-users and 4146 oBP users, there were 36 513 (42%) and 1330 (32%) recorded deaths, respectively. There were no significant interactions between BP use and gender, history of previous fracture and CKD stage. Adjustment for PS hazard ratio (HR) for all-cause mortality in oBP users was 1.04 (95% CI 0.99-1.1). Adjustment for PS following PS trimming at the 5th and 95th percentiles was 0.95 (95% CI 0.89-1.01).

Conclusions

oBP use is not associated with mortality amongst patients with advanced CKD (stage IIIB+). More data is needed on the risks and benefits of oBP in CKD patients.