

# Examining Survival Benefits of Higher Doses of Paricalcitol in Hemodialysis Patients: Propensity Score Matching and Overadjustment Bias

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## INTRODUCTION

Many epidemiologic studies have indicated survival benefits of active vitamin D agents including paricalcitol in hemodialysis (HD) patients (pts).

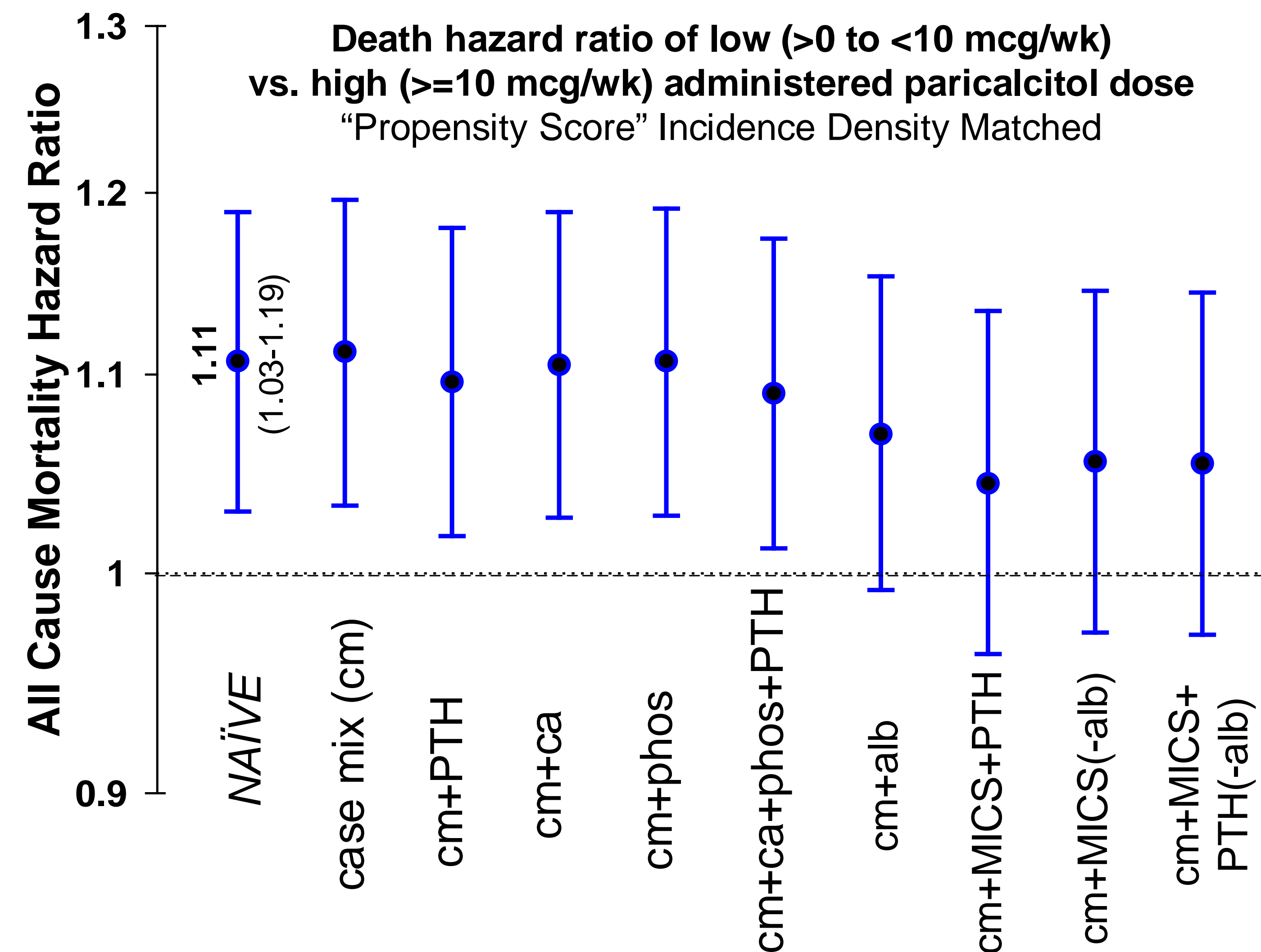
It is not clear whether higher paricalcitol dose is associated with even greater survival than lower dose.

In the 5-yr (7/2001-6/2006) cohort of DaVita HD pts, we examined death hazard ratios (HR) of low (>0 to <10 mcg/wk) vs. high (>10 mcg/wk) paricalcitol using propensity score (PS) and incidence density matching including matching on time.

## METHODOLOGY

- The PS was created as the likelihood (0.01 to 0.99) of receiving low vs. high dose based on age, sex, African American race, diabetes, dialysis vintage, dialysis dose (Kt/V single pool), residual renal function (Kru), and serum PTH, phosphorus and calcium.
- Then, the 2 groups (low vs. high paricalcitol dose) were 1:1 matched on gender, diabetes meelitus, age ( $\pm 5$  yrs), state (address), PS ( $\pm 0.05$ ), African American race (vs. others), dialysis vintage time (4 groups), and baseline calendar quarter (1 to 20 quarters).

## RESULTS



## CONCLUSIONS

- Out of 28,914 pts in the low dose and 39,368 pts in the high dose group, 14,414 pts (7,212 in each group) were perfectly matched.
- The matched pts were  $63.6 \pm 12.8$  yrs old and included 44% women, 27% blacks and 49% diabetics.
- The 5-yr death risk of low vs. high paricalcitol dose was 1.11 (95% CI: 1.03-1.19,  $p < 0.001$ ). Including additional (doubled or redundant) multivariate adjustments mitigated the association in some but not all categories (see Figure).

## KEY LEARNINGS

- ✓ In an extensively matched model to adjust for potential known confounders, higher ( $\geq 10$  mcg/wk) paricalcitol dose was associated with a greater survival benefit than lower dose over 5 yrs of observation.
- ✓ Inappropriate multivariate adjustments may introduce new sources of errors and lead to "overadjustment bias", esp. if the model is adjusted for measures of the salutatory effects of the intervention or those in the causal pathway.

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