

RISK FACTORS FOR PROGRESSION OF COMMON INTIMA-MEDIA THICKNESS IN INDIVIDUALS WITH CHRONIC KIDNEY DISEASE: THE NEFRONA STUDY.



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Objectives:

Cardiovascular disease (CVD) is one of the leading causes of death in chronic kidney disease (CKD)¹. The early diagnosis of subclinical atheromatosis and the specific factors involved are important for cardiovascular risk assessment². The aim of this study is to analyze the factors associated with a high CCIMT at baseline, and the risk factors predicting an accelerated progression of common carotid intima-media thickness (CCIMT) in CKD patients.

Methods:

NEFRONA was designed as a Spanish multicentre CKD cohort study, with patients without previous history of CVD. The CCIMT was measured by ultrasound at the far wall on both common carotid arteries free of atheroma plaque. The analysis was performed by the same itinerant team with an single image reader. Study dependent variables were high CCIMT at baseline (defined as ≥ 75 th percentile) and CCIMT accelerated progression (defined as ≥ 75 th percentile of the difference between the last and the first CCIMT measurements over 2 years of follow-up (2010-2012)).

Figure 1. Accelerated progression of CCIMT (mm/year) stratified by sex and CKD stage, in the presence or absence of plaque at bifurcation or internal carotid arteries.

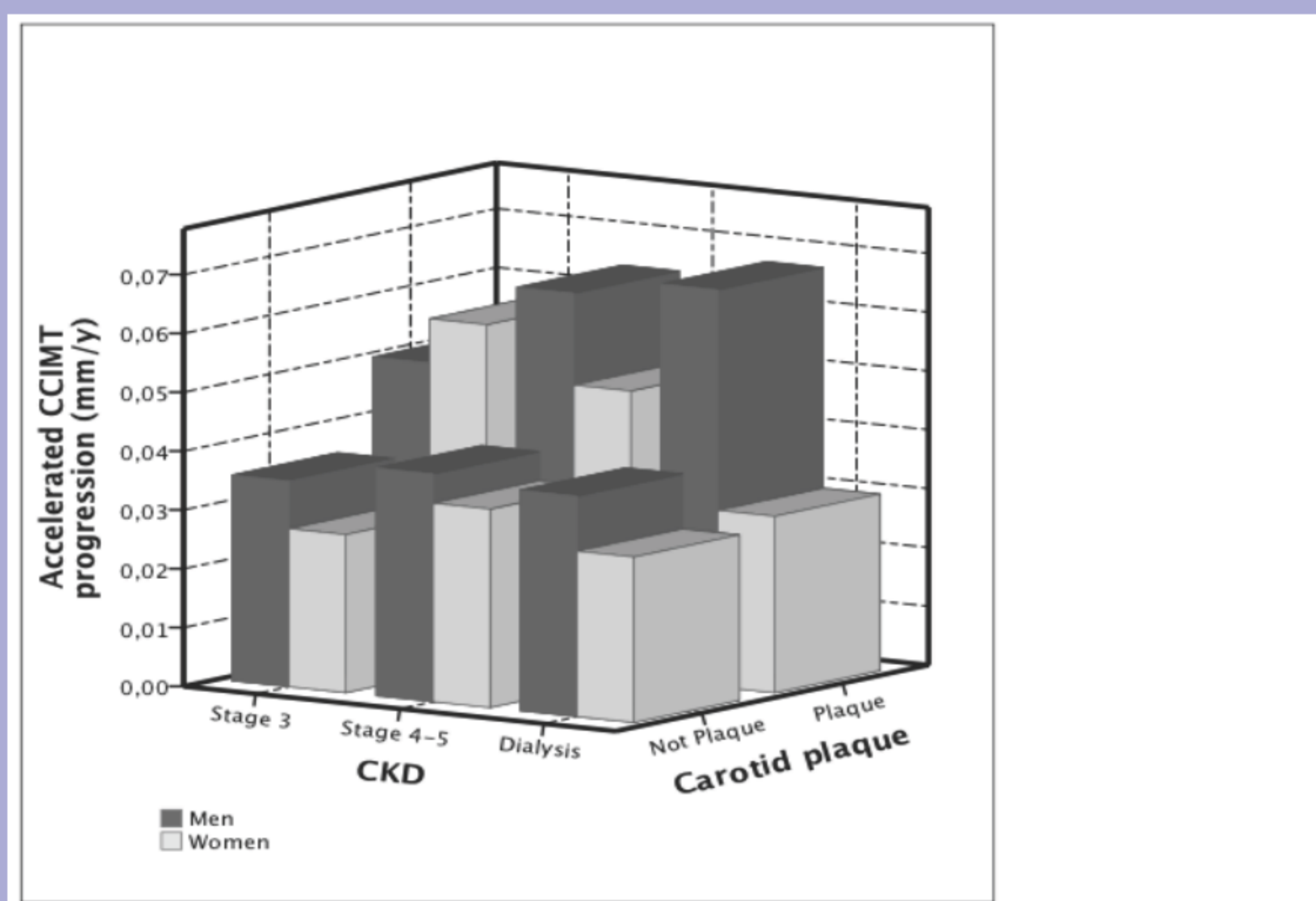


Figure 2. Factors associated with a high CCIMT at baseline and accelerated CCIMT progression.

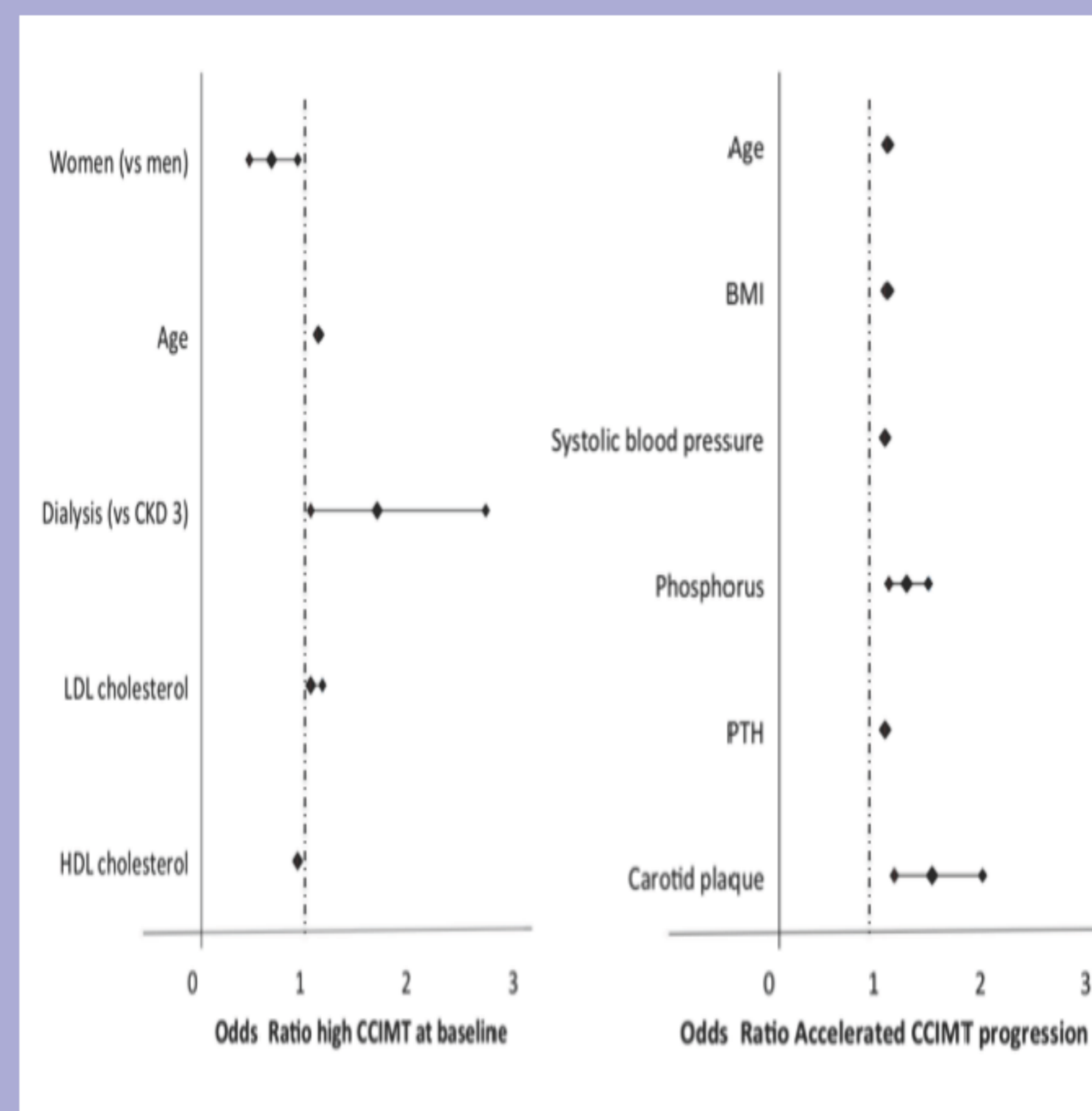
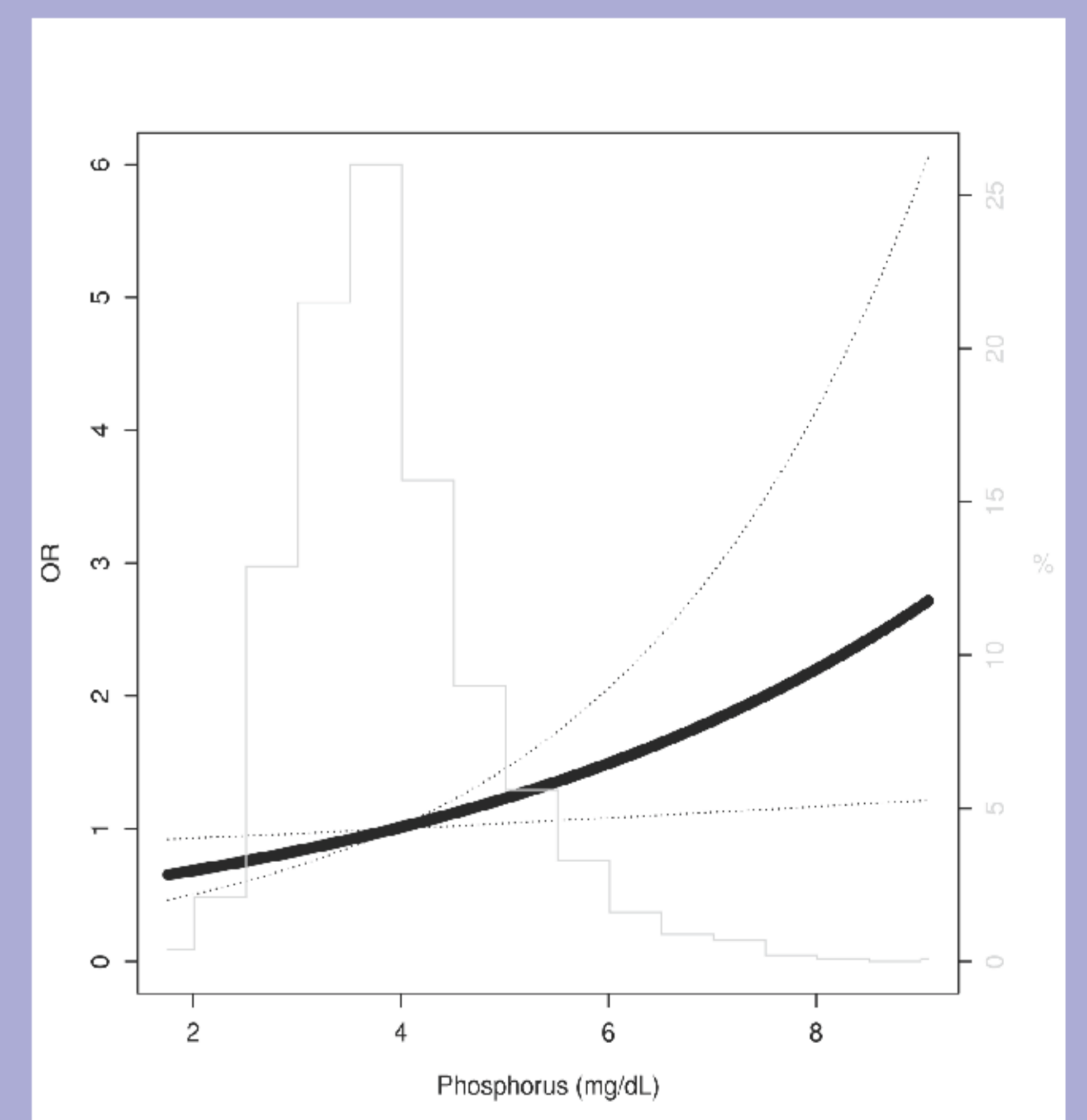


Figure 3. Odds Ratio of phosphorus levels for accelerated CCIMT progression.



Results:

The study included 1.352 CKD patients (629 stage 3, 559 stage 4-5 and 233 on dialysis), with a mean age of 57.9 ± 12.6 years. Of these, 59.3% were men, 54.3% former or current smokers, 22% diabetics, 91.3% hypertensives and 68.1% dyslipidemics.

CCIMT at baseline was significantly different between CKD stages, being higher on stage 3 (0.739 ± 0.15 mm) than stage 4-5 (0.692 ± 0.14 mm) or stage 5D (0.706 ± 0.14 mm). The threshold where the 75th percentile of patients most progressed was 0.0425 ± 0.016 mm per year. The accelerated progression of CCIMT was significantly higher in the presence of carotid plaque among CKD 3-5 and among men on dialyses than in the absence of plaque (figure 1).

Significant factors associated with a high baseline CCIMT (figure 2) were age, male sex, smoking, dialysis, high LDL cholesterol levels and low HDL cholesterol levels.

Independent risk factors predicting an accelerated CCIMT progression were age, smoking, body mass index, parathyroid hormone, phosphorus levels (figure 3) and the presence of plaque at the other arterial segments examined.

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Conclusions:

The present study demonstrates that factors specifically related to CKD appear to be relevant for subclinical atheromatosis progression, suggesting a potential role of serum PTH concentrations and high phosphorus levels for accelerated progression of CCIMT.

References:

1. Gansevoort RT, Correa-Rotter R, Hemmelgarn BR, Jafar TH, Heerspink HJL, Mann JF, et al. Chronic kidney disease and cardiovascular risk: epidemiology, mechanisms, and prevention. *Lancet* 2013;382(9889):339–52.
2. Naqvi TZ, Lee M-S. Carotid intima-media thickness and plaque in cardiovascular risk assessment. *J Am Coll Cardiol* 2014;7(10):1025–38.

