

# OSTEOSCOOP

News on current events in osteoporosis and rheumatology

## Bone markers predict cardiovascular Events in chronic kidney disease

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Recent studies have indicated a link between bone metabolism and cardiovascular events in patients with chronic kidney disease (CKD). CKD is a major health problem worldwide. This study [1] evaluates the role of noninvasive markers of bone metabolism in predicting cardiovascular morbidity (coronary artery disease, peripheral vascular disease, stroke) and mortality in patients with mild to severe forms of CKD. In a prospective cohort study, 627 patients with CKD were screened. To focus on bone metabolism, traditional risk factors for cardiovascular events were excluded, and 135 patients with CKD stages 1–5 were followed for 4 yrs. Glomerular filtration rate was calculated by the Modification of Diet in Renal Disease (MDRD) formula. PTH (measured by four different assays), vitamin D 25 and 1,25, bone-specific alkaline phosphatase (BSALP), TRACP-5b, osteocalcin, serum collagen cross-link molecules, RANKL, and osteoprotegerin were determined. Predictors of cardiovascular events were evaluated by multivariable logistic regression, Kaplan-Meier survival, and Cox regression analysis.

There were a total of 45 cardiovascular events (33%). Event rates were 5.6%, 29.1%, 45.2%, and 45.0% in CKD stages 1–2, 3, 4, and 5, respectively. In logistic regression, cardiovascular events were predicted only by (1) CKD stage (independent of age or sex;  $p < 0.001$ ); (2) BSALP ( $p < 0.03$ ); and (3) TRACP-5b ( $p < 0.04$ ). Higher BSALP tertiles were associated with a higher hazard of CV events. In contrast, higher TRACP-5b seemed protective of the same outcome.

In conclusion, markers of bone formation (BSALP) and resorption (TRACP-5b) can serve as predictors of cardiovascular morbidity and mortality in CKD.

1. Fahrleitner-Pammer A et al. *J Bone Miner Res.* 2008;23:1850–1858.

### Bone markers predict cardiovascular events in chronic kidney disease

Because recent studies have indicated a link between bone metabolism and cardiovascular events in patients with chronic kidney disease, a recent study evaluated the role of noninvasive markers of bone metabolism in predicting cardiovascular morbidity and mortality in patients with mild to severe forms of chronic kidney disease. Higher bone-specific alkaline phosphatase tertiles were associated with a greater hazard of CV events. In contrast, higher tartrate-resistant acid phosphatase-5b seemed protective of the same outcome. These data show that markers of bone formation and resorption can serve as predictors of cardiovascular morbidity and mortality in chronic kidney disease.

HRs of BSALP and TRACP-5b by tertiles for CV events

	Bone formation marker BSALP tertile (µg/L)	Bone resorption marker TRACP-5b (U/L)
<b>Tertile 1</b>		
Range for tertile	11.0-37.0	1.20-3.20
HR		
Unadjusted	1.0	1.0
Adjusted	1.0	1.0
<b>Tertile 2</b>		
Range for tertile	37.1-85.0	3.21-4.70
HR		
Unadjusted	1.16	1.10
Adjusted	1.83	0.69
<b>Tertile 3</b>		
Range for tertile	85.0-154	4.71-10.85
HR		
Unadjusted	2.09	1.15
Adjusted	3.88	0.46

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