CKD-MBD
Chronic Kidney Disease Mineral and Bone Disorder

CKD-MBD related publications in the ERA journals
From January to June 2023

The ERA acknowledges the high clinical and scientific relevance of the CKD-MBD syndrome, reflected by several key publications in the journals of our society. We hereby summarize the content of several recent important papers, providing a link to their abstracts and/or full texts.

From January to June 2023, 24 CKD-MBD related articles have been published, including editorial comments, experimental studies and one correction; 20 in Nephrology Dialysis and Transplantation and 4 in the Clinical Kidney Journal.

1) **Cardiovascular (CV) calcifications and CV-associated topics** were the subject of many reports. **C-Y.J. Jung et al** (Nephrol Dial Transplant 38 (3):712-721) reported from the KNOW-CKD cohort that the coronary artery calcification score (CACS) was also independently associated with adverse CV outcomes and all-cause death in Korean patients with CKD G1-5. Moreover, **Y. Kim et al** (Nephrol Dial Transplant 38 (6):1439-1447) described that higher CACS were progressively associated with an increased risk of CKD, even at low CACSs, in asymptomatic Korean young and middle-age adults. Interestingly, **J. Liu et al** (Nephrol Dial Transplant 38 (6):1421-1429) developed a kidney-reabsorption-related magnesium *depletion* score in order to identify individuals with magnesium deficiency status who may benefit from dietary magnesium supplementation to reduce the risks of abdominal aortic calcification among US adults. Treatment-wise, **W. Wen et al** (Nephrol Dial Transplant 38 (3):733-745) reported that intravenous sodium thiosulphate may attenuate the progression of vascular calcification and arterial stiffness in hemodialysis patients after a systematic review and meta-analysis. **R.M. Holden et al** (Nephrol Dial Transplant 38 (3):746-756) demonstrated that phylloquinone (vitamin K_1) improved vitamin K status, and that a fully powered randomized clinical trial may be feasible to demonstrate inhibition of progression of coronary artery calcification (iPACK-HD study). Regarding intermediate end-points, **U. Thiem et al** (Nephrol Dial Transplant 38 (5):1282-1296) reported that high-dose (2g/day) exposure to sucroferric oxyhydroxide reduced endogenous calciprotein particle (CPP) formation in dialysis patients and yielded serum with attenuated pro-calcific and inflammatory effects in vitro. On the other hand, **M.K. Tiong et al** (Nephrol Dial Transplant 38 (2):344-351) reported that lanthanum carbonate was *not* associated with a reduction of CPPs at 96 weeks when compared with placebo in a CKD G3b-4 cohort (IMPROVE-CKD). **A.L. Negri** (Clin Kidney J 16 (2):205-209) reviewed the role of prolyl hydroxylase/HIF-1 signaling in VC. Finally, in experimental models, **G. Van den Bergh et al** (Nephrol Dial Transplant 38 (5):1127-1138) demonstrated that vascular alterations (including nitric oxide bioavailability) develop early after CKD induction and precede medial calcifications development, and **N. Vergara et al** (Nephrol Dial Transplant 38 (2):322-343) demonstrated a direct effect of FGF23 on changing the contractile to a synthetic vascular smooth muscle cell (VSMC) phenotype in *experimental* conditions, as well as associations with impaired vascular function even in CKD G2-3 patients.

2) Regarding different **biomarkers**, **Y. Okute et al** (Nephrol Dial Transplant 38 (4):1002-1008) described a novel independent association between serum phosphate (P) and cholesterol metabolism (absorption). **M. Barreto Lopes et al** (Nephrol Dial Transplant 38 (1):193-202) described that serum P>5.5 mg/dL was highly prevalent (37%) in *peritoneal dialysis* (PD) patients, and higher serum P levels were a strong predictor of morbidity and death, particularly when considering *serial* P measurements. **G. D'Arrigo et al** (Nephrol Dial Transplant 38 (4):932-938) described that *repeated* measurements of serum PTH, calcium and P as well as *baseline* FGF23 and 1,25-dihydroxyvitamin D were independently related with the progression to kidney failure in a cohort of stage 2–5 CKD patients. **L. Magagnoli et al** (Nephrol Dial Transplant, advanced-article) reported that CKD-MBD is very common

in older non-dialysis patients with advanced CKD. In this study, PTH and P were independently associated with all-cause mortality. While PTH level was only associated with CV mortality, P seemed to be associated with both CV and non-CV mortality. **B. Martín-Carro et al** (Nephrol Dial Transplant, advanced-article) analysed from the COSMOS study the different association of PTH with the relative risk of mortality in dialysis diabetic and non-diabetic patients. Somehow surprisingly, high serum PTH (>9 times the normal values) was significantly associated with a higher relative risk of mortality in diabetic patients but not in non-diabetic patients. Finally, **D. Smout et al** (Clin Kidney J 16 (3):408-421) reviewed the promising role of microRNA's as emerging biomarkers and therapeutic targets of bone fragility in kidney disease.

3) Regarding CKD-MBD **treatments, M. Ketteler et al** (Nephrol Dial Transplant 38 (6):1397-1404) reviewed the treatment of secondary hyperparathyroidism in *non-dialysis* CKD. **M. Ketteler et al** (Nephrol Dial Transplant 38 (4):982-991) reported that modified-release nicotinamide combined with P-binders significantly reduced serum P over the first 24 weeks of treatment in *hemodialysis* patients, but the treatment effect was not maintained up 52 weeks (non-compliance related?). **A.Y-M. Wang et al** (Nephrol Dial Transplant 38 (8):1823-1835) described from a pilot prospective study (PROCEED) that both cinacalcet and parathyroidectomy (PTX) effectively improved biochemical abnormalities of CKD-MBD and stabilized but did not reduce several intermediate end-points regarding left ventricular mass, calcification or patient-centered measures in *peritoneal* dialysis patients with advanced SHPT.

4) **Miscellany**: **M. Haarhaus et al** (Clin Kidney J 16 (3):456-472) reviewed traditional and novel approaches to the management of fracture risk in CKD, and **B. Batteaux et al** (Clin Kidney J 16 (3):571-584) suggested that loop diuretics and opioids increase the risk of fractures in kidney transplant recipients. **P.L.G. Esper et al** (Nephrol Dial Transplant 38 (2):425-434) reported that bone disease represents an early event among stone formers, at least in part associated with calcium excretion and mainly characterized by trabecular bone microarchitecture impairment, especially among women, but with reduced bone strength parameters in men. **A. Kale et al** (Nephrol Dial Transplant 38 (4):819-825) reviewed the interrelationship between klotho, the renin-angiotensin system and endoplasmic reticulum stress in kidney diseases. Finally, we underline that some **corrections** were reported to the original paper on secondary hyperparathyroidism treatment and the risk of dementia (Nephrol Dial Transplant, advanced-article).

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