Bone, Vitamin D and CKD

Vitamin D & Cardiorenal Outcomes in CKD-MBD

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Vitamin D promotes calcium and phosphorus intestinal absorption, renal calcium reabsorption, skeletal growth and reduces parathyroid glands hypertrophy in CKD. Furthermore, both vitamin D deficiency as well as overabundance has been associated with extensive vascular calcification. Hence, vitamin D has classically been regarded as a mineral metabolism homeostasis regulator and vitamin D deficiency as a mineral metabolism homeostasis regulator and vitamin D deficiency as a key therapeutic target for CKD-MBD correction.

A few RCTs have tested the impact of selective VDR activator on mineral metabolism, renal and cardiovascular organ damage. The IMPACT study showed that primary end point was iPTH levels and subjects with intravenous paricalcitol were more effective than cinacalcet treatment. The VITAL study is that tested whether paricalcitol add-on reduces albuminuria in DM nephropathy patients. A significant 18% greater reduction of urine albumin creatinine ratio was noted among subjects treated with paricalcitol. However, this result limited only albuminuria, not renal survival. Finally, the effect of paricalcitol on LVH was investigated in the PRIMO study. At the end of 48 weeks of treatment, no between-group changes in Lt. ventricular mass index were observed. However, a significant reduction in the beta natriuretic peptide increase, Lt. atrium volume and hospitalization among paricalcitol-treated patients were reported. Based on these results, further RCTs are investigated to test whether selective VDR may improve cardiovascular and renal survival compared to standard therapy in CKD-MBD.

A deficit in vitamin D is commonly reported as one of the first steps in CKD-MBD, and numerous epidemiological studies have associated serum vitamin D levels with different markers of CV disease and the risk of death in different populations. Herein, I summarize current evidence that links vitamin D deficiency to an adverse outcome and the results of the most recent clinical trials that have investigated the impact of VDR activator supplementation on outcomes in CKD patients.