

Problems with mineral metabolism linked with kidney disease progression

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Abnormalities of mineral metabolism worsen with progressive chronic kidney disease (CKD) and are linked with a higher risk for kidney failure among African Americans, according to a study appearing in an upcoming issue of the *Journal of the American Society of Nephrology* (JASN). The findings suggest that measuring mineral metabolites may be a useful way to determine a CKD patient's prognosis, and targeting mineral metabolites may help slow progression of the disease.

It is often difficult for physicians to differentiate which patients with CKD will go on to develop advanced stages of the disease and which will remain more stable over time. They do know that CKD tends to progress more rapidly to kidney failure in African Americans than in Caucasians and that disordered mineral metabolism—which occurs when failing kidneys do not maintain the proper levels of minerals in the blood—is more severe among African Americans with CKD. This might partially explain the accelerated progression of their disease.

To investigate, Julia Scialla, MD, Myles Wolf, MD (University of Miami Miller School of Medicine) and their colleagues measured blood levels of various mineral [metabolites](#) over an average of four years in 420 CKD patients who participated in the African American Study of Kidney Disease and Hypertension. "We were hoping to determine whether abnormal blood levels of calcium and phosphate, and the hormones that regulate them—fibroblast growth factor 23, vitamin D, and [parathyroid hormone](#)—are risk factors for kidney disease progression in African American," said Dr. Wolf. The researchers also looked for a potential

link between levels of these mineral metabolites at the start of the study and risk for kidney failure or death in 809 participants.

Among the major findings:

- FGF23, PTH, and phosphate levels rose over time; the greatest increases occurred in participants with faster rates of [kidney function](#) decline.
- Patients with the highest levels of FGF23 at the start of the study had more than a two-fold increased risk of kidney failure or death independent of kidney function compared with patients with the lowest levels. Higher blood levels of PTH and phosphate were associated with a more modestly increased risk.
- Vitamin D insufficiency was present in 95% of participants, but lower levels were not independently linked with [kidney failure](#) or death.

The findings suggest that abnormal levels of mineral metabolites convey clinically relevant information for assessing the likely progression of CKD beyond measurements of kidney function that clinicians already monitor routinely.

"Also, it might be possible to slow kidney [disease progression](#) in African Americans using treatments that normalize mineral levels and the hormones that regulate them. Clinical trials are needed to prove this hypothesis," said Dr. Scialla.

More information: The article, entitled "Mineral Metabolites and CKD Progression in African Americans," will appear online at [doi: 10.1681/ASN.2012070713](https://doi.org/10.1681/ASN.2012070713)

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