Fibroblast Growth Factor (FGF-23) Testing

Fibroblast growth factor 23 (FGF-23) is an endocrine hormone produced primarily by bone osteocytes. FGF-23 regulates phosphate and vitamin D metabolism by inhibiting phosphate reabsorption and 1,25-dihydroxy vitamin D (1,25-D) production by the kidney. Measurement of FGF-23 can aid in the diagnosis of patients with disorders associated with hypophosphatemia and hyperphosphatemia.

FGF-23 is elevated in several inherited and acquired disorders of mineral metabolism characterized by rickets and osteomalacia, including the following1,2,3:

- Tumor-induced osteomalacia (TIO)
- X-linked hypophosphatemic rickets (XLH)
- Autosomal dominant hypophosphatemic rickets (ADHR)
- Autosomal recessive hypophosphatemic rickets (ARHR)

These disorders have in common hypophosphatemia due to renal phosphate wasting and inappropriately low 1,25-D levels.

Chronic kidney disease (CKD) is the most common condition associated with elevations of FGF-23. In CKD, measurement of FGF-23 may have a diagnostic, prognostic, and therapeutic role. Recent studies have shown that elevated FGF-23 levels develop early in CKD and rise progressively with advancing disease.3,5 Not only might this elevation help maintain phosphate balance in the setting of kidney disease, but it also might decrease 1,25-D levels, which act as a feedback inhibitor of parathyroid hormone (PTH), thus contributing to secondary hyperparathyroidism, a common CKD complication.3,5

In CKD, FGF-23 elevation has been associated with the following:

- Early abnormalities in mineral metabolism prior to elevation of PTH and phosphate or decline of 1,25-D6,7
- Increased risk of cardiovascular disease8,10
- Increased risk of kidney disease progression11,12
- Increased mortality in both CKD and end-stage renal disease1,2,13
- Increased mortality and allograft loss in kidney transplant patients14

Additional studies have shown that FGF-23 levels can be reduced with established CKD therapies, including phosphate binders in normophosphatemic CKD patients15 and cinacalcet in hemodialysis patients.16

LabCorp offers an enzyme-linked immunosorbent assay (ELISA) for measurement of FGF-23 (004380). This assay has been used in many large clinical studies in which FGF-23 was measured.3,7-9,14 It is a second-generation C-terminal assay that measures both the intact molecule and C-terminal fragments.17

References