Bone and Mineral Metabolism and Fibroblast Growth Factor 23 Levels After Kidney Donation

- **Background**
  Living kidney donation offers a unique setting to study changes in phosphate and vitamin D homeostasis attributable to mild isolated decreases in estimated glomerular filtration rate (eGFR).

- **Setting & Participants**
  198 living kidney donors and 98 nondonor controls from 9 transplant centers across 3 countries. For donors, median time after donation was 5.3 years. At assessment, donors had a lower eGFR than controls (73 vs 98 mL/min/1.73 m2).

- **Measurements**
  Serum creatinine, total serum calcium, serum and urine inorganic phosphate, plasma intact parathyroid hormone, serum calcidiol and calcitriol, renal fractional excretion of inorganic phosphate, and intact serum fibroblast growth factor 23 (FGF-23).

- **Results**
  Serum FGF-23 levels were significantly higher in donors (38.1 vs 29.7 pg/mL; P < 0.001). For every 10-mL/min/1.73 m2 decrease in eGFR, FGF-23 level was higher by 3.2 (95% CI, 2.0-4.4) pg/mL. Compared with controls, donors showed higher renal tubular fractional excretion of inorganic phosphate (17.8% vs 12.3%; P < 0.001), lower serum phosphate (0.97 vs 1.02 mmol/L; P = 0.03), and lower serum calcitriol values (63 vs 77 pmol/L; P < 0.001). Serum calcium levels were not significantly different between the 2 groups. Plasma intact parathyroid hormone levels were significantly higher in donors (5.7 vs 5.0 pmol/L; P = 0.03), but were not correlated with FGF-23 or calcitriol levels.

- **Conclusions**
  The FGF-23 pathway may be activated in living kidney donors who show early biochemical changes compatible with chronic kidney disease–mineral and bone disorder. Whether these changes influence bone mineral density and fracture rates warrants consideration.