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Mineral Metabolism Adaptation in Living Kidney Donors: Prospective Observational Study

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Objectives: The aim of this study is to investigate whether uninephrectomy for kidney donation cause change of bone and mineral metabolism and also investigate factors associated with it in prospective kidney donors after uninephrectomy

Methods: Serum and urine creatinine, calcium, phosphorus, and serum intact parathyroid hormone (iPTH), 25(OH) vitamin D and FGF-23 values were obtained pre-donation and postoperatively in 68 donors. Renal fraction excretion rate of phosphate (FEpi) was calculated with 24-hour urine collection. Pre- and post-donation GFR was measured by DTPA scan in all donors.

Results: After donor nephrectomy (median 7 months, 4-18months), MDRD eGFR declined (91.4 to 62.2 ml/min/1.73m^2) and remnant kidney's GFR measured by DTPA scan increased (55.1 to 71.3 ml/min), significantly. (both $p<0.001$) Post-donation serum iPTH increment was marked (43.0 Vs 60.1 pg/ml, $p<0.001$), whereas 25(OH) vitamin D level change was not significant (25.7 to 25.0 ng/ml, $p=0.573$). After donation, serum Ca was changed from 9.15 to 9.16 ($p=0.856$), serum phosphate changed from 3.6 to 3.4 ($p=0.005$). Renal fraction excretion rate of phosphate (FEpi) was increased after donation. (14.6 to 20.3, $p<0.01$) In comparison to pre-donation, FGF23 levels are no significantly changed (1094pg/ml vs 1169pg/ml, $p=0.766$).

Conclusions: From after kidney donation, living kidney donor develop secondary hyperparathyroidism related to a decreased serum phaosphate, increased renal fraction excretion of phosphate. FGF23 levels do not rise in living kidney donors. Mineral metabolism adaptation to decreased eGFR in donors might differ from those in CKD patients maybe due to remnant intact nephrons.