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Change of bone and mineral metabolism in kidney donors after uninephrectomy; 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 values were obtained pre-donation and postoperatively in 32 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. We defined post-donation chronic kidney disease-mineral bone disorder (CKD-MBD) as higher serum iPTH level than median (59.7 pg/ml) of all donors at post-transplant, and investigate factors associated with the development of CKD-MBD

Results : After donor nephrectomy, MDRD eGFR declined (93.1 to 61.2 ml/min/1.73m2) and remnant kidney's GFR measured by DTPA scan increased (53.9 to 63.8 ml/min), significantly. (both $p<0.001$) Post-donation serum iPTH increment was marked (56.8 Vs 47.4 pg/ml, $p=0.055$), and 25(OH) vitamin D level also rose (27.0 to 30.2 ng/ml, $p=0.364$). After donation, serum Ca was changed from 9.19 to 9.26 ($p=0.181$), serum phosphate changed from 3.4 to 3.3 ($p=0.434$). Renal fraction excretion rate of phosphate (FEpi) was increased after donation. (14.4 to 21.4, $p<0.01$) Compared with no-CKD group, CKD group showed higher increment of GFR by DTPA scan (15.1 Vs 8.6 ml/min/1.73m2, $p=0.069$), higher increase of serum P level (+0.12 Vs -0.19, $p=0.044$), and higher change in serum Ca X P (1.4 Vs -1.7, $p=0.04$) In logistic regression analysis, after adjusting sex, age, BMI, pre-donation eGFR, the predictors of development of CKD-MBD was pre-donation FEpi. (OR 0.811, 95% CI 0.658-0.998, $p=0.048$)

Conclusions : Donor nephrectomy caused a significant change in bone and

mineral metabolism in in prospective kidney donors and pre-donation FEpi couble be a good predictive marker for early expecting development of CKD-MBD.

Keywords : Kidney donor, mineral bone disease(MBD)