

SA-PO2786

Fibroblast Growth Factor 23 (FGF23) after Kidney Donation Per-Anton Westerberg,¹ Jonas Wadström,² Östen Ljunggren,¹ Björn Wikström,¹ Torbjörn Linde.¹ ¹Department for Medical Sciences, Internal Medicine, Uppsala, Sweden; ²Department for Surgical Sciences, Transplant and Hepatic Surgery, Uppsala, Sweden.

Aim: The circulating level of the phosphaturic factor FGF23 increases in chronic kidney disease (CKD) and is correlated with glomerular filtration rate (GFR). It is not known how FGF23 is regulated in CKD. Kidney donation offers an opportunity to examine the effect of a moderate decrease in GFR on FGF23. **Study subjects and methods:** Nine healthy kidney donors were included, six females and three males, of mean age 56 years (range 38-69), with an iothexol-clearance of 98.4±14 ml/min/1.73 m². We measured circulating levels of cystatin C, ionized calcium (Ca), phosphorus (Pi), bioactive parathyroid hormone (bPTH), full length FGF23, and renal excretion of Pi and Ca, before laparoscopic nephrectomy, after one day, one week and six months.

Results: see table 1. Postoperatively plasma Ca decreased (p<0.001), and there was a trend to an increase in PTH (p=0.14), and to a decrease in FGF23 (p=0.1). After one week Ca levels where normalized while there was a significant rise in the FGF23 level. The Pi levels remained stable. At follow-up the GFR had recovered partially, and PTH, FGF23, Ca and Pi where not significantly different compared to before nephrectomy. The tubular reabsorption of Pi (TRP) was decreased, while the excretion of Pi (dU-Pi) where unchanged: 28.9 ± 7.4 mmol/day before nephrectomy and 33.0 ± 11.9 mmol/day after six months. The urinary Ca decreased from 6.1 ± 2 mmol/day to 3.6 ± 1 mmol/day (P<0.05) at six months.

table1

	before surgery	after one day	one week	six months
eGFR (ml/min)	106±17	76±24*	60±20*	70±13*
FGF23 (pg/ml)	31.8±12	24.6±11	55±15**	36.3±13.8
biPTH (pg/ml)	20.0±7	28.0±12	14.5±	18.7±8
TRP (%)	85	81	not determined	72*

*: p<0.05, ** p<0.001 in comparison to before surgery

Conclusion: FGF23 rises because of decreased renal clearance after nephrectomy, and decreases again as GFR recover. The serum level of Pi and dU-Pi remain stable. TRP decreases as GFR decreases, but that change is not associated with a change in serum levels of FGF23 or PTH.

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Prevalence and Risk Factors for Vitamin D Deficiency in Patients with Chronic Kidney Disease in a Subtropical Climate Brian J. Siva,¹ Emma Duncan,² Carmel M. Hawley,¹ Nikky M. Isbel.¹ ¹Department of Nephrology, Princess Alexandra Hospital, Brisbane, Queensland, Australia; ²Department of Endocrinology, Princess Alexandra Hospital, Brisbane, Queensland, Australia.

Aims:

Low 25-Hydroxyvitamin D3 (25(OH)D3) and 1,25-dihydroxyvitamin D3 (1,25(OH)2D3) are frequently reported in the literature but has mainly represented patients from temperate climates. This study investigated the prevalence and predictors of vitamin D deficiency in a CKD population from southeast Queensland.

Methods:

25(OH)D3 and 1,25(OH)2D3 levels and bone mineral parameters were measured in 112 patients with CKD stages 3 and 4.

NKF/KDOQI guidelines were used to define 25(OH)D3 deficiency as < 40nmol/L with 25(OH)D3 insufficiency as 40-75nmol/L. 1,25(OH)2D3 deficiency was defined as levels < 57pmol/L.

iPTH and urine protein creatinine ratio(urPCR) levels were log transformed due to their skewed distribution.

Results:

Mean 25(OH)D3 was 69.53 ± 29.09 nmol/L. 44 patients(39.3%) had 25(OH)D3 insufficiency and 16 patients(14.3%) had frank deficiency. Mean 1,25(OH)2D3 levels were 70.82 ± 30.59 pmol/L with 42 patients(37.5%) being deficient. 25(OH)D3 and 1,25(OH)2D3 levels were not different according to CKD stage.

Median iPTH level was 8.4(5.3-14) pmol/L with 68 patients(60.7%) having hyperparathyroidism (iPTH > 7.0 pmol/L).

25(OH)D3 levels were significantly associated with log iPTH levels. Independent predictors of low 25(OH)D3 were female gender (beta = 0.19, P = 0.04) and log urPCR(beta = -0.18, P = 0.057) but not age, eGFR, calcium and phosphate levels.

1,25(OH)2D3 did not correlate significantly with 25(OH)D3. Independent predictors of lower 1,25(OH)2D3 were Diabetes Mellitus(beta = -0.22, P = 0.029) and log urPCR(beta = -0.21, P = 0.027)

Hyperparathyroidism was best predicted by eGFR(beta = -0.34, P < 0.001), 25(OH)D3 (beta = -0.41, P < 0.001) and 1,25(OH)2D3 (beta = 0.18, P < 0.01).

Conclusion:

Vitamin D deficiency and secondary hyperparathyroidism were highly prevalent even in a subtropical climate. 25(OH)D3 correlates better with secondary hyperparathyroidism than 1,25(OH)2D3. Predictors of low 25(OH)D3 were female gender and proteinuria.

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SA-PO2788

Osteoclast-Like Multi-Nucleated Giant Cells Are Associated with Regression of Tumoral Calcinosis Shunsuke Yamada,¹ Masatomo Taniguchi,¹ Kazuhiko Tsuruya,² Mistuo Iida.¹ ¹Department of Medicine and Clinical Science, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan; ²Department of Integrated Therapy for Chronic Kidney Disease, Graduate School of Medical Sciences, Kyushu University, Fukuoka, Japan.

[Introduction] Tumoral calcinosis is an ectopic calcification occasionally seen in hemodialysis patients, characterized by massive periarticular deposition of calcium and phosphorus. We sometimes encounter hemodialysis patients with tumoral calcinosis, which completely disappeared after appropriate medical treatment or parathyroidectomy. Recent studies have uncovered some aspects of the etiology of ectopic calcification, and some researchers have already pointed out the association of multinucleated giant cells with regression of tumoral calcinosis. However, the precise features of these multinucleated giant cells remain unclear.

[Material and Method] We obtained the resected specimen of tumoral calcinosis around hip joint from a patient on hemodialysis, whose tumoral calcinosis around the other large joints disappeared after appropriate medical treatment without surgical removal. We examined the resected tissues of tumoral calcinosis by histology and immunohistochemistry (IHC). The IHC included CD68, tartrate acidic phosphatase (TRACP), osteocalcin (OC), osteopontin (OP) and calcitonin receptor (CTR).

[Result] Light microscopic examination of the resected tumoral calcinosis revealed recruitment of many multinucleated giant cells surrounded by mononuclear cells with fibrous tissues with Hematoxylin-Eosin staining. IHC revealed that both mononuclear cells and multi-nucleated giant cells were positive for CD68, TRACP and CTR. However, both cells are negative for OC and OP.

[Conclusion] Multinucleated giant cells recruited to tumoral calcinosis might be derived from mononuclear cells of macrophage-lineage and have similar characters to osteoclasts in the bone. And these giant cells might be involved in the regression of tumoral calcinosis by removing extraosseous calcification around large joints as osteoclasts do in the bone.

Disclosure of Financial Relationships: nothing to disclose

SA-PO2789

Fibroblast Growth Factor 23 and PTH Are Strong Determinants of the Bone Mineral Density Changes Occurring within the First Post-Renal Transplantation Year Kathleen Claes,¹ Nada Kanaan,² Jean-Pierre Devogelaer,³ Dirk Vanderschueren,⁴ Eric Goffin,² Pieter Evenepoel.¹ ¹Nephrology, Dialysis and Transplantation, University Hospital Gasthuisberg, Leuven, Belgium; ²Nephrology, University Hospital St-Luc, Brussels, Belgium; ³Rheumatology, University Hospital St-Luc, Brussels, Belgium; ⁴Endocrinology, University Hospital Gasthuisberg, Leuven, Belgium.

Background: The determinants of the BMD changes within the first year after transplantation still remain ill-defined. FGF-23 is a phosphaturic hormone accentuating hypophosphatemia and suppressing calcitriol levels in the early post-Tx period. The aim of this study was to identify the determinants of the BMD changes occurring within the first post-renal Tx year. **Methods:** We performed a two-centre observational cohort study (2001-2008) in renal transplant recipients. Parameters of mineral metabolism including whole PTH, 25 OH vitamin D and full-length FGF-23 were determined at the time of Tx. BMD was assessed by DEXA within 14 days and 12 months after Tx at the lumbar spine (L), femoral neck (FN) and total hip (TH), and expressed at 12 months as the percentage of the pre-Tx value. **Results:** One hundred and twenty-seven patients (62% men; mean age 51.1 ± 13.3 years) were included. Median whole-PTH, 25 OH vitamin D and FGF-23 levels were 43 pg/ml, 31.3 µg/l and 6158 pg/ml respectively. BMD changes at 12 months post-Tx averaged -2.2, -3 and -2.2 % for L, FN and TH, respectively. Univariate analysis demonstrated that high pre-Tx FGF-23 was associated with high BMD loss in L and TH, while low pre-Tx PTH was positively correlated with BMD loss in all three regions. Prednisolone cumulative dose was not correlated with BMD changes, nor was age, sex, or pre-Tx 25 OH vitamin D levels. Multivariate analysis found that pre-Tx FGF-23 levels were independently associated with BMD changes in L and TH and PTH levels were independently associated with BMD changes at all three sites.

Conclusion: A moderate decrease in BMD is observed within the first year post-renal TP. Increased levels of pre-TP FGF-23 and decreased levels of PTH, but not cumulative prednisolone dose, are predictors of BMD changes.

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SA-PO2790

FGF23 and Left Ventricular Hypertrophy in Chronic Kidney Disease Orlando M. Gutierrez,¹ James Januzzi,¹ Tamara Isakova,¹ Robert Christenson,² Christopher de Filippi,² Myles Wolf.¹ ¹Medicine, Massachusetts General Hospital, Boston, MA; ²Medicine, University of Maryland, Baltimore, MD.

Background: Left ventricular hypertrophy (LVH) and coronary artery calcification (CAC) are common complications that are potent risk factors for cardiovascular mortality in patients with CKD. We recently reported that increased fibroblast growth factor 23 (FGF23) concentrations are independently associated with mortality on dialysis in a dose-response fashion; few studies examined whether FGF23 is also linked with LVH or CAC. We tested the hypothesis that FGF23 is independently associated with LVH and CAC in a cross-sectional study of patients with CKD. **Methods:** 162 subjects with CKD underwent ECHOs to measure left ventricular mass index (LVMI) and LVH, and CT scans to assess