

VITAMIN D STATUS IN KIDNEY TRANSPLANT RECIPIENTS: AN ITALIAN COHORT REPORT

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INTRODUCTION AND AIMS

Abnormal low levels of vitamin D are frequent in both general population and in patients with chronic kidney disease.

In kidney transplant recipients, serum vitamin D levels are reported to increase from early post-transplant period. In this population, however, the assessment of vitamin D levels is not routinely performed despite the pleiotropic action of the hormone involved in both bone health control and in the reduction of diabetes, cardiovascular disease and cancer.

Therefore, it is clinically relevant to assess calcidiol concentration and find any potential factor which may affect its concentration.

The aim of this cross-sectional study is to assess the levels of serum calcidiol and find out any potential factor associated with low calcidiol concentration in kidney transplant patients.

METHODS

132 kidney transplant recipients, followed in one nephrology unit, were enrolled.

The analyzed variables were immunosuppressive agents, supplementary intake of calcidiol or 1-25-dihydroxyvitamin D, intact PTH, eGFR, serum calcium, serum phosphorus, urinary calcium excretion, urinary phosphorus excretion, lactate dehydrogenase, creatine phosphokinase, total protein, albumin.

On the basis of serum calcidiol levels patients were classified as suffering from hormone insufficiency (< 30 ng/mL), deficiency (< 20 ng/mL) or severe deficiency (<10 ng/mL). Hip and lumbar spine BMD was measured by dual-energy X-ray absorptiometry (DXA).

RESULTS 1

Cohort clinical characteristics and blood chemistry are listed in Tab 1.

Primary renal diseases were: glomerulonephritis (40.9%), ADPKD (18.2%), hypertension (3%), diabetes mellitus (4.5%), interstitial nephritis (9.8%), other diseases (23.6%).

Mean serum calcidiol levels were 17.5±8.7 ng/mL. Vitamin D insufficiency, deficiency and severe deficiency was observed in 19.7 %, 34.5 %, 34.1%, respectively.

Only 9.8 % of the patients had normal calcidiol levels.

Tab 1: CLINICAL CHARACTERISTICS AND BLOOD CHEMISTRY OF PATIENTS.

25-hydroxyvitamin D levels, ng/ml	< 10	≥ 10 - 20	≥ 20 - 30	≥30
Patient, % (n)	34.1 (45)	36.4 (48)	19.7 (26)	9.8 (13)
Age, y.	56±10	50±12	56±11	63±11 ●●
Male, %	68.2	64.6	76.9	71.4
Smokers, %	9.1	6.3	23.1	7.1
BMI kg/m ²	24±3	24±3	24±3	22±4
Outdoor Workers	65.9	66.7	84.6	78.6
Dialysis Months before TX*	31±24	24±22	34±43	23±24
TX* Months	121±127	105±92	123±98	125±107
eGFR ml/min	49±27	55±17	54±17	57±20
Serum Calcium mmol/l	2.2±0.3	2.3±0.1	2.3 ±1.6	2.3±0.1
Serum Phosphorus mg/dl	3.2±0.8	3.1±0.7	3.3±0.5	3.4±0.6
Calcidiol ng/mL	6.7±1.9	14.3±3.0	24.5±2.6	32±2.3
PTH pg/ml	113±64	121±94	76±27	63±21 ●●
Urinary Calcium mmol/die	2.3±2.3	3.2±2.6	3.0±2.6	3.3±3.3
Urinary Phosphorus g/die	0.6±0.2	0.74±0.29	0.77±0.32	0.95±1.6 ●
Total Protein g/dl	6.5±0.5	6.6±0.5	6.8±0.6	6.4±0.5
Systolic BP, mmHg	133±14	128±14	129±14	127±15
Diastolic BP, mmhg	77±7	77±8	79±7	77±7

*TX: Transplantation; ●● = p:0.001; ● = p:0.02

RESULTS 2

No differences were observed between males (15.9±8.8 ng/mL) and females (14.5±8.5 ng/mL), seasonal blood collections (winter/autumn 15.4±8.6 ng/mL VS summer/spring 16.0±9.6 ng/mL) or exposure to sunlight (outdoor job 16.5±8.9 ng/mL VS indoor job 13.1±8.0 ng/mL).

In an univariate analysis, calcidiol levels were associated with eGFR (r= ,180; p=0.04), PTH (r= -,334; p=0.01), serum calcium (r= ,208; p=0.02) and PTH (r=-0.254, P<0.001).

On multiple regression analysis, PTH (Beta= -252; p=0.003) and serum calcium (Beta= ,180; p=0.03) predicted levels of calcidiol/ On multiple regression analysis, levels of calcidiol were expected with PTH (Beta= -252; p=0.003) and serum calcium (Beta= ,180; p=0.03).

In 53% of the patients, BMD T-score from lumbar spine (-1.48±0.95) and hip (-1.27±1.4) was considered osteopenia according to WHO.

CONCLUSIONS

Low levels of calcidiol are very frequent in kidney transplant patients. Less than 10% of the patients have normal serum concentration of calcidiol. By contrast, PTH and calcium serum concentrations influence calcidiol levels.

These findings should be taken into account in kidney transplant recipients with low calcidiol levels, who may benefit from oral vitamin D supplementation