RELEVANCE OF RENAL ALLOGRAFTS CALCIFICATIONS DETECTED BY PROTOCOL BIOPSIES

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BACKGROUND

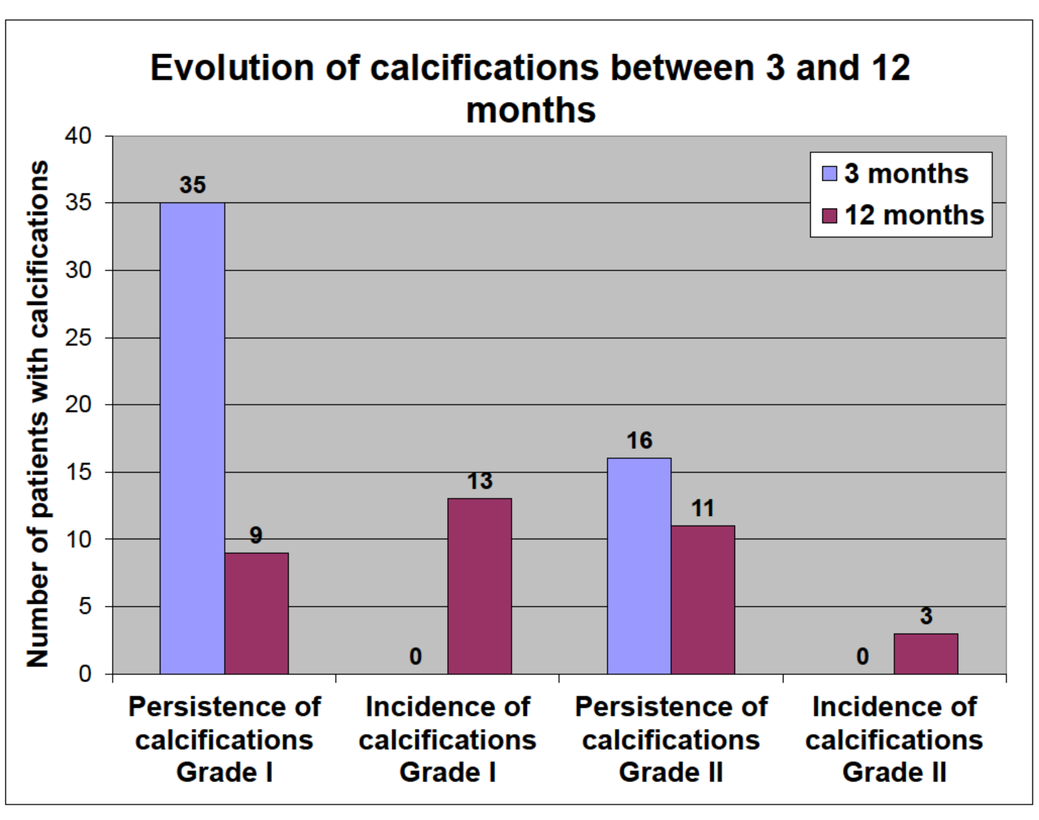
- Renal allograft calcifications have been reported in different studies, however, the etiology, risk factors and prognostic significance of this finding for the graft are unclear.

The aim of this study was to determine the prevalence and risk factors of calcium-phosphate deposits in renal grafts and see whether calcification is related to disturbed mineral metabolism and contributes to graft dysfunction at 1 year after transplantation.

METHOD

- Single-centre retrospective observational study including 188 renal transplants patients at our hospital between 2009-2011.
- We performed kidney protocol biopsies at 3 and 12 months.
- We evaluated demographic data, immunosuppression, renal function and biomarkers of mineral metabolism (calcium, phosphorus, i-PTH, alkaline phosphatase (AP), 25 Vitamine D) at 3 and 12months.
- Data analysis: Mann-Whitney U-test, chi-squared test or Wilcoxon Z-test as necessary.
- The assessment of the samples for the presence of calcifications was classified as: no calcifications, calcifications grade I (≤2 affected tubules) and calcifications grade II (>2 affected tubules). The presence of oxalate crystals was not studied.

RESULTS



- Allograft calcifications at 3 and 12 month, according to their severity

Total patients		Without (n=121)	With (n=67)	p value*
Recipient age (years)		50,61±13,57	50,01±13,40	0,777**
Gender (%)	Male/Female	65,3/34,7	74,5/25,5	0,186
Diabetes mellitus (%)		24	11,9	**0,047**
Donor (%)	Living/Deceased donor	55,4/44,6	44,8/55,2	0,164
Living donor (%)	BR/ Not BR / ABO incomp.	52,2/37,3/10,4	56,7/16,7/26,7	**0,04**
Deceased donor (%)	Standard/Expanded criteria	76,4/23,6	45,9/54,1	**0,003**
Immediate complications (%)				**0,045**
	No	64,5	50,7	
	ATN	16,5	34,3	
	Acute rejection	7,4	7,5	
	UTI	11,6	7,5	

BR = Blood related; ATN = acute tubular necrosis; UTI = urinary tract infection
*Analyzed with Pearson Chi-Square; ** Analyzed with Mann-Whitney U test

Total patients	Without (n=121)	With (n=67)	p value*
GFR 3m (mL/min)	52,53 ± 15,34	51,51 ± 15,29	0,954
GFR 12m (mL/min)	51,10 ± 15,98	54,86 ± 16,80	0,233
Creatinine 3m (mg/dL)	1,52 ± 0,73	1,68 ± 1,10	0,639
Creatinine 12m (mg/dL)	1,57 ± 1,07	1,47 ± 0,84	0,958
Calcium 3m (mg/dL)	9,86 ± 0,58	10,11 ± 0,80	0,146
Calcium 12m (mg/dL)	9,73 ± 0,60	9,95 ± 0,83	0,404
Phosphorus 3m (mg/dL)	3,19 ± 0,64	3,0 ± 1,07	**0,046**
Phosphorus 12m (mg/dL)	3,33 ± 0,65	3,56 ± 1,02	0,484
PTH 3m (pg/mL)	165,0 (123,0 - 203,0)	260,0 (123,0 - 442,0)	0,120
PTH 12m (pg/mL)	149,0 (87,25 - 241,0)	177,0 (117,0 - 333,0)	0,181
25Vitamin D 3m (ng/mL)	12,5 ± 5,12	14,03 ± 7,97	0,788
25Vitamin D 12m (ng/mL)	18,39 ± 8,85	18,73 ± 10,65	0,948
AP 3m (UI/L)	204,18 ± 73,58	264,53 ± 123,35	**0,012**
AP 12m (UI/L)	200,49 ± 88,11	241,67 ± 110,25	**0,027**

GFR = glomerular filtration rate; PTH = parathyroid hormone; AP = Alkaline phosphatase; 3m = 3 months; 12m = 12 months.
* Analyzed with Mann-Whitney U test

CONCLUSION

Renal graft's calcifications are a frequent finding and seem to be associated with donor subtype, acute tubular necrosis and alterations in mineral metabolism (alkaline phosphatase). No statistically significant differences in renal function at one year of follow-up were observed.

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