Prevalence of Hyperuricemia and Gout in Renal Transplanted Recipients

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Citation

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Abstract

Aim: Although the prevalence of hyperuricemia is high after renal transplantation, investigation has shown that gout occurs rarely in these patients. The present study was designed to investigate the prevalence of hyperuricemia and gout in renal transplant patients.

Materials and methods: The records of 155 patients (M/F, 119/36, mean age 34.7±9.7 years) who underwent renal transplantation in between 2000 and 2002 were retrospectively re-evaluated. Patients with at least 2 years stable graft survival duration were included. For each individual, mean value of serum uric acid levels that were repeated in each routine visits approximately every 6 months in transplantation outpatient clinic were used. Patient demographics, immunosuppressive drug regimens and other medications were also recorded. Hyperuricemia was defined as serum uric acid level of >6 mg/dl in females and 7 mg/dl in males. Clinical gout was defined as hyperuricemia with gouty arthritis and tophi.

Results: Hyperuricemia and gout were seen in 95 patients, and 13 patients, respectively. Mean serum uric acid levels were found to be independent from patients' age, sex, donor type, and immunosuppressive drug regimen.

Conclusion: Our study confirmed that although hyperuricemia is a common complication in renal transplant recipients, gout is not seen often in these populations.

INTRODUCTION

Hyperuricemia and gout are common metabolic and rheumatologic disorders among renal transplant recipients with the prevalence of 19-84% and 2-13% ([1,2,3,4]). Several factors may contribute to the development of hyperuricemia in this population including poor graft function (decreases in glomeruler filtration rate), hypertension, immunosuppressive drugs (especially cyclosporin A (CyA)) and diuretics ([5]). This relationship is important because hyperuricemia and gout may adversely affect renal function, and may also complicate the rehabilitation of renal transplant patients. Gout in renal transplant recipients follows a variable period of asymptomatic hyperuricemia. It is possible that the threshold for manifesting gout could be modified by the immunosuppressive regimen, but this remains to be proven ([4]). The aim of the present study was to determine the prevalence of hyperuricemia and gout and relationship with various predisposing factors.

MATERIALS AND METHODS

The medical records of 155 patients who had undergone renal transplantation in Baskent University Faculty of Medicine between 2000 and 2002 were retrospectively analyzed. All patients were on regular follow-up. Patients with at least two years graft survival duration and with serum creatinine level <1.5 mg/dL were included. For all patients, mean value of serum uric acid levels that were repeated in each routine visits approximately every six months in transplantation clinic were used in statistical correlation. We also recorded general characteristics of the patients, underlying renal disorders, donor type, age, gender, diuretic prescription, immunosuppressive regimen, history of gout, and urate lowering therapy. Hyperuricemia was defined as serum uric acid level of >6 mg/dL in females and 7 mg/dL in males. Clinical gout was defined as hyperuricemia with gouty arthritis, tophi and uric acid nephrolithiasis.

Statistical analysis was performed using 10.0 SPSS. Comparisons between variables were made with chi-squared tests. P values <0.05 are expressed as significant.

RESULTS

Characteristics of the patients, underlying renal disorders, and types of immunosuppressive treatment were shown in Table 1, 2, and 3. Of the 155 patients, 36 (23.2%) of the patients were women and 119 (76.8%) were men. The mean age was 34.7±9.7 (range, 14-64 years). Mean duration of renal transplant was 4.3±2.4 years. Patients receiving immunosuppressive therapy (other than corticosteroid) included CyA 71%, tacrolimus (FK) 29% and mycophenolate mofetil 63%. The mean serum uric acid levels were 6.3±1.6 mg/dL 1 month after renal transplantation. Hyperuricemia and gout were seen in 95 patients (61.3%), and 13 patients (8.4%) respectively, during the follow-up period. Mean serum uric acid levels were 8.2±2.3 mg/dL after 1 years and 8.6±2.5 mg/dL after 3 years (Figure 1, Table 4). The etiology of renal disease, age, sex, source of allograft, whether a patient was hypertensive or diabetes mellitus, use of diuretics were not associated with the development of post-transplant hyperlipidemia (P > 0.05).

Figure 1

Table 1: Baseline clinical characteristics of the study population

Characteristics	
Age (years) (mean±SD)	34.7±9.7
Male (n [%])	119 (76.8%)
Cadaver donor (n [%])	84 (54)
Diabetes Mellitus (n [%])	29 (19)
Hypertension (n [%])	84 (54)
Treatment with beta-blockers (n [%])	56 (31.2)
Treatment with diuretics (n [%])	42 (27)

Figure 2

Table 2: Underlying renal disorders

Diagnosis	Number of patients (n [%])
Unknown etiology	64 (41)
Diabetes Mellitus	23 (15)
Glomerulonephritis	36 (23)
Vesico-urethral reflux	22 (14)
Adult polycystic kidney disease	10 (7)

Figure 3

Table 3: Immunosuppressive drug regimen

Treatment regimen	Number of patients (n [%])
CyA based group (n=111)	
CyA+Pred+MMF	73 (47)
CyA+Pred	38 (24)
FK based group (n=44)	
FK+Pred+MMF	24 (16)
FK+Pred	20 (13)

Abbreviations: CyA, cyclosporine; FK, tacrolimus;Pred, steroid

Figure 4

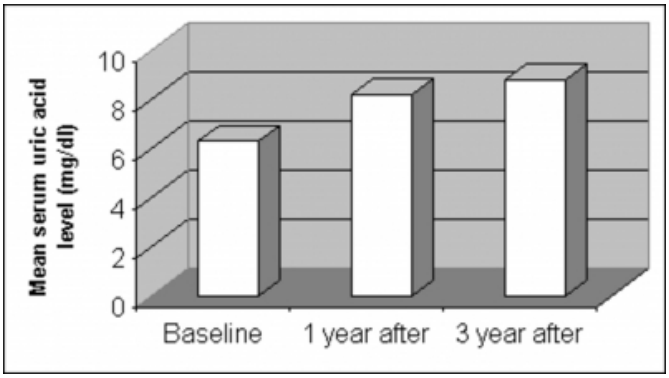
Table 4:Comparison of uric acid levels between patients cyclosporine (CyA) or tacrolimus (FK) based regimens

	Baseline	1 y. after transplantation	3 y. after transplantation
Uric acid (mg/dL)			
CyA	6.4±1.4	8.3±2.4	8.7±2.5
FK	6.0±1.8	8.1±2.6	8.5±2.3
P value for CyA vs. FK	*P*<0.001, *P*<0.001	*P*<0.001, *P*<0.001	*P*<0.001, *P*<0.001

Abbreviations: CyA, cyclosporine; FK, tacrolimus; y, years

Figure 5

Figure 1: The serum uric acid levels baseline, 1 year and 3 years after renal transplantation.



Comparison of uric acid between patients treated with CyA or FK based regimen showed similar baseline characteristics. A significant deterioration in uric acid after renal transplantation was noted in both CyA and FK based patients (Table 4).

DISCUSSION

Although hyperuricemia is a frequent finding among renal transplant recipients and may occur in 19-84% of patients ([1,2,3]), gout attacks are not frequently observed, occurring in 2-13% of them ([5]). In the present study, hyperuricemia was seen in 61.3% of patients while gout was observed in 8.4% of patients. Several factors contribute to the prevalence of hyperuricemia in this population. There are three principal factors involved in the development of hyperuricemia including decreases in glomerular filtration rate, the immunosuppressive drug regimen and diuretic therapy ([6]).

Results from previous studies revealed that hyperuricemia is mostly related to a reduction of tubular secretion of uric acid, especially in patients receiving cyclosporin A ([6,7,8]). Hyperuricemia and gout have been reported in patients treated with CyA and FK ([9,10]). In our study, we found that hyperuricemia occurred independently from the type of immunosuppressive drug.

In this study, we tried to correlate the prevalence of hyperuricemia and gout with various factors including age, sex, and etiologic factors for end stage renal disease, type of immunosuppresive regimen, diuretic therapy, and type of donor. We found no significant correlation between these factors and serum uric acid levels ([5]).

The prevalence of gout was similar to that reported in previous studies. Despite high serum uric acid levels, gout is not common in this population. This may be due to immunosuppressive therapy that might impair the phagocytic function of neutrophils and inflammatory response to monosodium urate crystals in synovial fluid and increase the threshold for manifesting clinical gout ([5]).

CONCLUSION

In conclusion, although the frequency of hyperuricemia is high, gout is not common in renal transplant recipients.

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