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Original Research Article

Analysis of Lipid Profile, Serum Albumin, and Uric Acid Level as Cardiovascular Risk factors Analysis in Renal Transplant Recipients

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Abstract: Successful kidney transplantation has been shown repeatedly to be associated with a reduction in mortality compared with dialysis. Studies suggest that this effect largely may be the result of the reduction in cardiovascular disease (CVD) associated with the improvement in renal function. In a retrospective analysis of the United States Renal Data System data consisting of more than 60,000 adult primary kidney transplant recipients transplanted between 1995 to 2000 and more than 66,000 adult wait-listed. Aim of the study is to analyze the risk factors for cardiovascular disease in the renal transplant recipients. All recipients were ABO compatible and cross-match negative and they are followed up regularly in nephrology transplant OPD. Recipients' demographic factors like Age, Gender, Occupation, and Literacy were noted. Nature of donor, post transplant duration, graft function were noted .Fasting blood samples were drawn to determine serum creatinine, Total cholesterol, Triglycerides, LDL and HDL cholesterol and Plasma Glucose concentrations, Hemoglobin,Serum albumin, Uric acid. Cardiovascular mortality is increased in patients with chronic kidney disease. Mortality from cardiovascular disease is10–20 times higher among individuals treated with dialysis, as compared to general population. The incidence of cardiovascular disease in kidney transplant patients is nearly twice that of the general population. Even young transplant recipients (aged 35–45 years) experienced an almost 10-fold increase in cardiovascular disease-related mortality.
Keywords: Cadaveric Graft Recipients, Metabolic Syndrome, Elevated LDL, Cholesterol, Post Transplant Erythrocytosis

INTRODUCTION

Dyslipidemia is a common occurrence after transplantation. The hyperlipemic effect of immunosuppressive agents including corticosteroids, cyclosporine, tacrolimus, and sirolimus has been well documented[1]. Although tacrolimus-based therapy has been suggested to be associated with better lipid profiles than cyclosporine-based therapy, sirolimus has been shown to be associated with a significantly greater incidence and severity of dyslipidemia than cyclosporine-based therapy, including higher total cholesterol and triglyceride levels [2]. Although hyperlipidemia often improves within the first 6 months after transplantation as the doses of prednisone, cyclosporine/tacrolimus, or sirolimus are reduced, total and low-density lipoprotein (LDL) cholesterol goals as defined by the National Cholesterol Education Program guidelines usually are not achieved and treatment frequently is required. Management of hyperlipidemia includes therapeutic lifestyle changes and pharmacotherapy Statins or the hydroxyl glutaryl (HMG)-CoA reductase inhibitors are the most widely used lipid-lowering agents in both the nontransplant and transplant settings[3]. The clinical benefits of statins have been shown in several large randomized controlled trials including the Heart Protection Study and the Lescol Intervention Prevention Study.Proteinuria has been reported to occur in 9% to 40% of kidney transplant recipients with a functioning allograft .As in the nontransplant setting, posttransplantation proteinuria has been shown to be an independent risk factor for CVD. In a retrospective study consisting of more than 500 Caucasian patients who received a deceased-donor renal transplant and had a functioning allograft for longer than a year[4]. Anemia after renal transplantation has a reported prevalence of 20% to 80%. The wide variation in the prevalence reported in part is owing to the variable definitions of anemia, immunosuppressive medications, time post transplantation, duration of follow-up evaluation, and level of allograft function, among others. In a retrospective study consisting of 92 renal transplant

recipients with a functioning allograft at 1 year, post transplant anemia, defined as a hemoglobin level of less than 13 g/dL for men and less than 12 g/dL for women, was found in 35.5% and 25% of patients at months 6 and 12, respectively[5]. In a multivariate analysis, the independent predictive factors of anemia at month 6 were erythropoietin level at day 0, cause of end-stage renal disease (polycystic kidney disease versus others), post transplantation recombinant erythropoietin therapy, hematocrit level at month 3, platelets at day 7, and sirolimus therapy[6]. Delayed graft function, renal function at month 12, and anemia at month 6 were independent risk factors for the presence of persistent anemia at 1 year.

MATERIALS AND METHODS

The study was conducted in Govt.Stanley Medical College & Hospital, Nephrology Department, Chennai. From October 2010 to November 2011 Ethical Committee approval from Stanley Medical College, Chennai was obtained for this study.

Inclusion criteria

Cadaver and Live related renal transplant recipients (RTR).

Exclusion criteria

1. Less than one month post transplant
2. Less than 18 years of age.
3. Death due to non cardiac causes during the study.
4. Graft dysfunction and on maintenance hemodialysis.

All recipients were ABO compatible and cross-match negative and they are followed up regularly in NEPHROLOGY TRANSPLANT OPD .Recipients demographic factors like Age, Gender, Occupation, Literacy were noted. Fasting blood samples were drawn to determine Serum creatinine, Total cholesterol, Triglycerides, LDL, HDL cholesterol and Plasma glucose concentrations[7].

Statistical Methodology

The statistical analysis had been done by using SPSS (Statistical Package on Social Science) version 15.0.The non-parametric model can be used to find out the relationship of categorical variable. One of the methods was Pearson's exact Chi-square.Multi variate analysis was done by Multiple Logistic regression Analysis.

RESULTS

Totally 170 recipients are on regular follow up in our department from the period October 2010 to November 2011.Patients who died in that period and those who are on irregular follow up are excluded from the study. Total patients are divided into groups according to FRAMINGHAM RISK SCORE to predict 10 year ABSOLUTE RISK of coronary heart disease event. Recipients were fit into risk category of 1-3%, 3-5%, 5-8%, 8-10% with prevalence of 80.6%, 11.8%, 4.7%, 2.9% respectively.

Table-1: Shows the mean total cholesterol among 170 recipients are on regular follow up

TOTAL CHOLESTEROL(mg/dl)	NUMBER	PERCENTAGE
<200	139	81.77%
>200%	31	18.23%

Legend: 1 High cholesterol was significantly correlated with cardio vascular risk score

Table-2: Shows the mean HDL levels among 170 recipients are on regular follow up

HDL	NUMBER	PERCENTAGE
LOW	31	26.47%
NORMAL	128	75.29%
HIGH	11	6.47%

Legend: 2 HDL was found be less among the population. Low HDL-cholesterol was significantly correlated with cardio vascular risk score

Table-3: Shows the mean LDL cholestrol levels among 170 recipients are on regular follow up

LDL (mg/dl)	NUMBER	PERCENTAGE
<100	135	79.42%
>100	35	20.58%

Legend:3 High LDL-cholestrol was significantly correlated with cardio vascular risk score.

Table-4: Shows the mean TGL levels among 170 recipients are on regular follow up

TGL(mg/dl)	NUMBER	PERCENTAGE
<200	160	94.12%
>200	10	5.88%

Legend :4 High TGL was significantly correlated with cardio vascular risk score

Table-5: Shows Proteinuria among 170 recipients are on regular follow up

URINE ROUTINE	NUMBER	PERCENTAGE
NO PROTEINURIA	139	81.76%
PROTEINURIA	31	18.24%

Legend: 5 Proteinuria was significantly associated with cardio vascular risk score

Table-6: S**hows the mean hemoglobin levels among 170 recipients are on regular follow up**

HEMOGLOBIN	NUMBER	PERCENTAGE
NORMAL	128	75.29%
PTE	15	8.82%
ANEMIA	27	15.88%

Legend : 6 Both Anaemia and post transplant erythrocytosis(PTE) had significant cardio vascular risk score

Table-7: Shows the mean Albumin levels among 170 recipients are on regular follow up

S. ALBUMIN(gm/dl)	NUMBER	PERCENTAGE
>3.5	127	74.71%
<3.5	43	25.29%

Legend : 7 Hypoalbuminemia had no significant association with cardio vascularrisk score

Table- 8: Shows the mean Uricacid levels among 170 recipients are on regular follow up

URIC ACID mg/dl	NUMBER	PERCENTAGE
<6	131	77.05%
>6	39	22.95%

Legend :8 Influence of serum uric acid over cardio vascular risk score not statistically significant

DISCUSSION

Our study analyzed the relationships among traditional and transplant specific risk factors and 10 year cardiovascular risk estimated by Framingham risk score. Overall 170 recipients who were on regular follow up in our department were included in this analysis. Total patients are divided into groups according to FRAMINGHAM RISK SCORE to predict 10 year ABSOLUTE RISK of coronary heart disease event. Recipients were fit into risk category of 1-3%, 3-5%, 5-8%, 8-10%. We found that 80.6% of recipients had 1-3% of 10 year CV risk, 11.8% had 3-5% of 10 year CV risk,4.7% had 5-8% of 10 year CV risk and 2.9% had 8-10% of 10 year CV risk [8]. Among the traditional risk factors, age > 40years was found to be statistically significant risk factor for 10 year CV risk. Almost 15.3% of the total study population was >40 years of which 19.2% had 10 year CV risk of 8-10%. In our study increased age was to be independent risk factor for higher CV risk in the multi variate analysis[9]. Renal insufficiency in renal transplant patients is a significant risk factor for adverse cardiovascular outcomes, Serum creatinine levels above 1.5 mg/dL (133 µmol/L) at one year post-transplant were significantly associated with an increased risk for cardiovascular disease. single- and multi-center reports estimate that, by one year post-transplant, 80 to 90 percent of adult recipients have total cholesterol levels >200 mg/dL , and 90 to 97 percent have LDL levels >100 mg/dL . Elevated serum cholesterol was found to be risk factor for CV events[10]. In our study prevalence of total cholesterol levels >200 mg/dL was 18.23%, LDL levels >100 mg/dL was 20.58%, triglyceride levels>200 mg/dL was 5.88%. All dyslipidemia was significantly associated with higher cardiovascular risk score and serum cholesterol levels >200 mg/dL was found to be independent risk factor for higher CV risk in the multi variate analysis.At one year post-transplant correlated with increased risks of acute coronary syndrome and heart failure[11]. Prevalence of proteinuria among recipients in our study was 18.24% which is significantly associated high cardio vascular risk score[12]. Prevalence of anemia in this study was 15.88%,where as post transplant erythrocytosis was 8.8%,the reported prevalence among renal transplant recipients of 20% to 80% [13]. In our study both anaemia and post transplant erythrocytosis associated with higher cardio vascular risk score which was statistically significant. Approximately 10% of patients exhibit hypoalbuminemia at 1 year and 20% at 10 years

after transplantation as reported.Hypoalbuminemia was 25.29% and had no correlation with cardio vascular risks[14]. The incidence of hyperuricemia in renal transplant recipients was 84 percent in those treated with cyclosporine versus 30 percent in patients treated with azathioprine and prednisone reported in our study prevalence of hyperuricemia was 22.95%, 33 percent in those treated with cyclosporine versus 9.3 percent in patients treated with azathioprine and prednisone. There was no significant correlation between hyperuricemia and high CV risks[15].

CONCLUSION

Although all the determinants of enhanced CVD risks in renal transplant recipients have not been well defined, both conventional and unconventional risk factors have been suggested to be contributory. The former risks include diabetes mellitus, hypertension, dyslipidemia, obesity, smoking, and family history.

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