

Original Research Article

Cardiovascular Risk factors Analysis in Renal Transplant Recipients

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Abstract: Renal transplantation is currently the preferred treatment modality for virtually all suitable candidates with end-stage renal disease. When compared with the general population, cardiovascular mortality in transplant recipients is increased by nearly 10-fold among patients within the age range of 35 and 44 and at least doubled among those between the ages of 55 and 64. All transplant recipients should currently be considered as coronary heart disease risk. This study was designed to analyze cardio-vascular risk factors among renal transplant patients. To analyze the risk factors for cardiovascular disease in the renal transplant recipients. Analytical study was done in Government Stanley hospital among renal transplant recipients. All recipients' profile of Age, Sex, Nature of the Donor, Post transplant duration in months was noted. Height and weight were measured. Body mass index was calculated. Waist circumference and Blood pressure were measured. Fasting and 2 hours postprandial blood were taken to analyze, Creatinine, Total Cholesterol, HDL, LDL, Triglycerides, Hemoglobin, Serum albumin, Serum uric acid. 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. The latter risks include pre-existing left ventricular hypertrophy, coronary artery vascular calcification, impaired allograft function, proteinuria, anemia, acute rejection episodes, hyperhomocysteinemia, and inflammatory cytokines. According to analysis following variables concluded as cardiovascular risk factors were Increased age, Deceased donor graft recipients, Metabolic syndrome, Post transplantation Diabetes, Elevated serum cholesterol, Elevated LDL cholesterol, Elevated TGL cholesterol, Anemia, and Post transplant erythrocytosis.

Keywords: obesity, Elevated serum cholesterol, Elevated LDL cholesterol, metabolic syndrome, Erythrocytosis.

INTRODUCTION

Successful kidney transplantation has been shown repeatedly to be associated with a reduction in mortality compared with dialysis [1]. 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 patients over the same time period [2]. Although the CVD death rates among transplant recipients were expectedly higher in the early postoperative period, they decreased significantly by 3 months post transplant. On long-term follow-up evaluation, although there seemed to be a modest increase in CVD death rates in the second transplant year, the rates actually remained low even among high CVD risk groups such as those with end-stage renal disease secondary to diabetes mellitus or

hypertension [3]. This finding likely reflects the impact of deteriorating transplant function on CVD death rates and is consistent with the relationship between declining renal function and CVD risk observed in non transplant chronic kidney disease. 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 [4]. The latter risks include pre-existing left ventricular hypertrophy, coronary artery vascular calcification, impaired allograft function, proteinuria, anemia, acute rejection episodes, hyperhomocysteinemia, and inflammatory cytokines. More recently, CD4lymphopenia and cytomegalovirus (CMV) infection also has been suggested to be associated with cardiac complications and atherosclerosis. Selected CVD risks are discussed here [5].

Major Risk Factors for Coronary Heart Disease in ATP III Guidelines

- Cigarette smoking
- Hypertension (ie, blood pressure >140/90 mm Hg or on antihypertensive medication)
- High LDL cholesterol (ie, >159 mg/dL)
- Low HDL cholesterol (ie, <40 mg/dL)
- Family history of premature coronary heart disease (ie, <55years of age in male first-degree relative or <65 years of age in female first degree relative)
- Age (men >45 years and women >55 years)
- Diabetes

Risk Factors Associated with Kidney Disease or Transplant

- Immunosuppressive agents
- Graft failure
- Graft dysfunction (elevated homocysteinemia, proteinuria, predisposition to vascular calcification)
- Anaemia

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:

Deceased donor and Live related renal transplant recipients (RTR).

Exclusion criteria

- Less than one month post transplant
- Less than 18 years of age
- Death due to non cardiac causes during the study
- 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. Nature of donor, post transplant duration, graft function were noted. All recipients' profile of Age, Sex, Nature of the Donor, Post transplant duration in months was noted. Height and weight were measured. Body mass index was calculated. Waist circumference and Blood pressure were measured. Fasting and 2 hours postprandial blood were taken to analyze, Creatinine, Total Cholesterol, HDL,LDL, Triglycerides, Hemoglobin, Serum albumin, Serum uric acid.

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

Total numbers of recipients were 170, among 124 were male, 46 were female. Live donor transplant was 142, deceased donor transplant was 28. Mean age was 32.7years, Mean post transplant duration was 53.7months. Prevalance of cardiovascular risk factors among renal transplant recipients as follow:

VARIABLE	NUMBER	PERCENTAGE
OVERWEIGHT	30	17.64%
METABOLIC SYNDROME	53	31.18%
POST TRANSPLANTATION DIABETES	33	19.41%
SYSTEMIC HYPERTENSION	136	80%
CARDIAC DYSFUNCTION	15	8.82%
HYPERCHOLESTOLEMIA	31	18.23%
POSTTRANSPLANTERYTHROCYTOSIS	15	8.82%
ANEMIA	27	15.88%
HYPOALBUMINEMIA	43	25.29%
HYPERURICEMIA	39	22.95%

DISCUSSION

Cardiovascular mortality is increased in patients with chronic kidney disease. Mortality from cardiovascular disease is 10–20 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 [6]. Even young transplant recipients (aged 35–45 years) experienced an almost 10-fold increase in cardiovascular disease-related mortality. 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 In the Assessment of LESCOL in Renal Transplantation (ALERT) trial [12], an increased serum creatinine concentration, particularly higher than 2.3mg/dL (200 micromol/L), was strongly associated with an increased risk of adverse cardiac events and cardiac death. In our study graft dysfunction was present in 51.75% and among them 4.5% had no significant but increased 10 year CV risks compared to those who had normal graft function in which only 1.2% had a risk score of 8-10% [7]. The reported incidence of POST TRANSPLANTATION DIABETES MELLITIS (PTDM) in renal transplant recipients is 4% to 25%, in our study it the incidence of PTDM was 19.41%. Kidney transplant recipients who developed PTDM are at 2- to 3- fold increased risk of fatal and nonfatal CVD events. We also observed statistically significant relation between PTDM and higher cardiovascular risk. In our study among the 19.41% of patients with PTDM, 12.1% had a CV risk of 8-10% compared to 0.7% in those without PTDM. Hypertension is present in 50% to 90% of renal transplant recipients were stated by Kasiske *et al.* [14]. Though Systemic Hypertension was regarded as one of the modifiable risk factor of CV risks compared to general population, renal transplant recipients had higher prevalence of SHT and because of its universal distribution deMattos AM *et al.* [13] did not find any correlation between SHT and cardiovascular risk in his study.[9] In our study SHT was present in 80% of the patients and there was no statistically significant relation between SHT and higher CV risks. 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% by Afzali B *et al.* [15], Report from Vlahakos DV *et al.* [16] PTE is affecting 8 to 15 percent of kidney transplant Recipients. In our study both anaemia and post transplant erythrocytosis associated with higher cardiovascular risk score which was statistically significant in compare to study by Imoagene- Oyediji *et al.* [17] revealed that the cohort with anemia at 12 months, defined as a hemoglobin level of less than 12 g/dL, had inferior patient survival and a higher proportion of cardiovascular deaths (6.3% versus 2.2%) compared with the non anemic patients. The beneficial effect of statins was greatest in the lowest LDL subgroups (LDL < 60). Whether this effect can be extrapolated to renal transplant recipients awaits further studies. Results of the Assessment of LESCOL in Renal Transplantation study revealed that treatment of renal transplant recipients with fluvastatin over a 5- to 6-year period significantly and safely reduced LDL cholesterol levels [9] The incidence of major adverse cardiac events also was shown to be reduced, albeit not statistically significant. However, further analysis showed a beneficial effect of early initiation of fluvastatin on outcome the earlier the initiation of therapy, the greater

the reduction in cardiac events. For patients initiated on therapy within the first 4 years post transplant, there was a risk reduction of 64% compared with 19% for patients initiated on therapy after 10 years [11].

CONCLUSION:

According to analysis following variables concluded as cardiovascular risk factors were Increased age, Deceased donorgraft recipients, Metabolic syndrome, Post transplantation Diabetes, Elevated serum cholesterol, Elevated LDL cholesterol, Elevated TGL cholesterol, Anemia, and Post transplant erythrocytosis.

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