Original Research Article

Post renal transplant infections: One year follow up study

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Abstract

Introduction: Transplantation returns the majority of patients to an improved life-style and an improved life expectancy, as compared to patients on dialysis; however, careful prospective cohorts studies have yet to be reported. Infection is a leading cause of morbidity and mortality in transplant recipients, with more than 80% suffering at least one episode of infection in the first year. The risk for infection is strongly determined by an interaction between epidemiologic exposures and net state of immunosuppression.
Aim and objectives: To study the prevalence of infections in the post renal transplant recipients**,** to find out the most common cause of infections in post renal transplant patients, to find out the frequency of infections in early and late phase of renal transplantation.
Materials and methods: Patients who reached end stage renal disease and who underwent Renal Transplantation in our hospital was prospectively followed up for infections for a period of 1 year.
Results: A total of 77 transplant recipients were included in our study. Out of which, 50 recipients (69.44%) had infections during follow up. 32 recipients (64 %) had infections involving more than one system. The infectious were common within the first 6 months of surgery and most of them occurred within the first month of surgery.
Conclusions: Urinary Tract infection was the most common confection occurring in the post renal transplant recipients.

Key words

Renal transplantation, Post transplant infection, Immunosuppression.

Introduction

Transplantation of the human kidney is frequently the most effective treatment of end stage renal disease. Worldwide, tens of thousands of such procedures have been performed. When azathioprine and prednisone were initially used as immunosuppressive drugs in the 1960s, the results with properly matched familial donors namely, 75 to 90% compared with 50 to 60% graft survival rates at 1 year. During the 1970s and 1980s, the success rate at the 1 year mark for cadaveric transplants rose progressively. By the time cyclosporine was introduced in the early 1980s, cadaveric donor grafts had a 70% 1-year survival and reached the 82% level in the mid 1990s and 88% by 1998. After the first year, graft survival curves show an exponential decline in numbers of functioning grafts from which a half-life (ti/2) in years is calculated this has increased by 24 years since the 1980's. Mortality rates after transplantation are highest in the first year and are age-related: 2% for ages 18 to 34 years, 3% for ages 35 to 49 years, and 6.8% for ages over 50-60 years. These rates compare favorably to those in the chronic dialysis population even after risk adjustment for age, diabetes, and cardiovascular status. Occasionally, acute irreversible rejection may occur after many months of good function, especially if the patient neglects to take the immunosuppressive drugs. Most grafts, however, succumb at varying rates to a chronic vascular and interstitial obliterative process termed chronic rejection, although its pathogenesis is incompletely understood [1]. Overall, transplantation returns the majority of patients to an improved life-style and an improved life expectancy, as compared to patients on dialysis; however, careful prospective cohorts studies have yet to be reported.

Infection is a leading cause of morbidity and mortality in transplant recipients, with more than 80% suffering at least one episode of infection in the first year.

The risk for infection is strongly determined by an interaction between epidemiologic exposures and net state of immunosuppression. The transplant patient is susceptible to any environmental infectious exposure or reactivation of a previously latent infection. In addition, the risk of infection is influenced by other factors: indwelling catheters, malnutrition, uremia, hyperglycemia, and infection with immuno modulating viruses such as CMV, Epstein-Barr virus, HBV, HCV and HIV.

In the First post-transplant month, postoperative surgical infections such as those that occur in non-immunosuppressed patients subjected to the similar surgical procedures are most common [2].

From 1 to 6 months, the most important causes of infection are viruses and opportunistic agents (P. Carinii, Listeria monocytogenes, and A. Fumigatus). Of the viral causes, CMV causes more than two thirds of the febrile episodes seen in the first 6 post-transplant months.

After 6 months, three distinct patient subgroups have been identified: those with good allograft function and on minimal maintenance immunosuppression (with the same risk as the non-immunosuppressed patient to develop infections common to the general population such as pneumococcal infection); patients chronically infected with latent viruses (these patients often succumb to the end-organ damage induced by the chronic viral infection); and the final sub group been patients with poor allograft function (i.e. serum creatinine > 2.7. mg/dL), a history of multiple rejection episodes, and a history of excessive immunosuppression (these patients are more likely to develop acute and chronic opportunistic infections).

Although any viral, bacterial, or fungal pathogen can infect patients after transplantation, those organisms with the greatest impact and greatest frequency of infection are discussed here.

Aim and objectives

- To study the prevalence of infections in the post renal transplant recipient.
- To find out the most common cause of infections in post renal transplant patients.
- To find out the frequency of infections in early and late phase of renal transplantation.
- To correlate the incidence of various infections with the literature.

Materials and methods

Settings

Patients who reached end stage renal disease and who underwent Renal Transplantation in Nephrology Department. Urology Department in Government General Hospital, Chennai, Tamil Nadu was followed up from Post Renal Transplantation ward and reviewed monthly in Transplantation OPD and in Nephrology Ward when admitted subsequently for various reasons for a period of 1 year.

Study design

Single Centre observational prospective hospital based study. Government General Hospital, Chennai, Tamil Nadu is a tertiary case institute and referral centre for patients from all over Southern India.

Exclusion criteria

- Patient who didn't survive for more than 1 year (even with a transplant).
- Metastatic Malignancy, not responsive to therapy.
- Acute/ Chronic Infections that are not controlled.
- Severe Psychiatric disease that impairs patient's consent and compliance.
- Recurrent and persistent non compliance with medications substance abuse (includes tobacco abuse at some transplant centers).
- Immunologic incompatibilities (ABO Blood Group Mismatch and positive cross match).

Sample size

77 patients who underwent renal transplantation during the year 2005- February 2006 were included and followed up from their immediate post-operative period in Post Transplantation Ward and reviewed monthly in Transplantation Out patient Department for a period of one year after transplant.

Study methodology

All patients were subjected to the specific questions in the proforma and enquiry was also made on the sense of well being.

All patients who were culture positive were considered as having infection.

Results

A total of 77 transplant recipients were included in our study. Out of which, 50 recipients (69.44%) had infections during follow up. Majority were males, 38 recipients (76%) and 12 female recipients (34%). 32 recipients (64 %) had infections involving more than one system. The infections occurring within one month after renal transplant was 42 recipients (33.6%), between one to six months were 63 recipients (50.4%) and more than six months were 20 recipients (16%) as per **Table – 1 to 3** and **Figure – 1 to 6**.

Table - 1: Showing type of Infections.

UTI	**55**
RTI	**21**
GIT	**22**
Skin	**11**
ENT	**2**
Others (Meningitis, Sepsis, Wound Infections)	**17**

Discussion

Out of the 77 patients followed up, 50 of them (65%) were infected, in comparison to 81.25% based on study by Ahern MJ, et al. [3], and 32

had infections involving abolishing more than one system, one patient died at 4 months of transplantation due to septicemia. The infectious were common within the first 6 months of surgery and most of them occurred within the first month of surgery.

Table - 2: Showing Nature of Infections.

Bacterial	**93**
Viral	**17**
Fungal	**16**
Protozoal	**2**

Urinary Tract infection was the most common confection occurring in the post renal transplant recipients. It occurred in 72.7% of the transplant recipient in comparison with 31% based on study by Chan PC, et al. [4] and 61% based on the study conducted by Krieger JN, et al. [5]. Most of the infectious occurred during early months of transplantation and the most common organism was E. coli and Klesiella. Gastro intestinal infection occurred in 17.2% of transplant recipients and the most common organism was Candida. Fungal infections occurred in 8% of the transplanted recipients in comparison with 18% based on a study by Attoparmark M R, et al. [6]. Respiratory tract infection occurred in 16.3% of the transplant recipient in comparison with 33% based on the study by the Jha R, et al. [7].

Table - 3: Showing Organisms involved.

Organisms Involved	**<1 month**	**1-6 M**	**>6 M**
A) Bacterial			
E.coli	8	12	7
Klebsiella	7	7	3
Pseudomonas	5	7	1
S.aureus	6	3	
Coag.negative stap.	2	6	1
Gram Positive Cocci	1	3	
Acino Bacter		3	
Salmonella		2	
B) Viral			
CMV	3	3	
H.Zoster	1	2	1
Hepatitis C	1	1	
Hepatitis B		1	
Dengue	1		
C) Fungal and Protozoal			
Candida	4	9	2
T.Cruris	1		
Malaria	1	2	
Echinococcus	1	1	

Limitations

We followed the recipients for only one year after renal transplant. The study could not detect the infection caused by organisms like P. caranii, N. asteroides, L. monocytogenes, T. gonidii, etc. as their diagnostic methods were not followed.

Conclusion

Infection and rejection, the two primary barriers to successful organs transplantation, are inextricably linked. The optimal treatment of the transplant recipient has two components; an immunosuppressive regimen to prevent and treat

graft rejection, and an antimicrobial strategy that is closely tied to the specifics of the immunosuppressive program in the individual patient. As new immunosuppressive programs are defined, new antimicrobial programs will be necessary. To increase the safety of organ transplantation further, we need improved diagnostic tests to detect infection early and to monitor immune function, as well as new therapies to overcome antimicrobial resistance.

Acknowledgements

We like to thank department of Nephrology Madras medical college hospital.

Figure - 1: Showing Type of Infections.

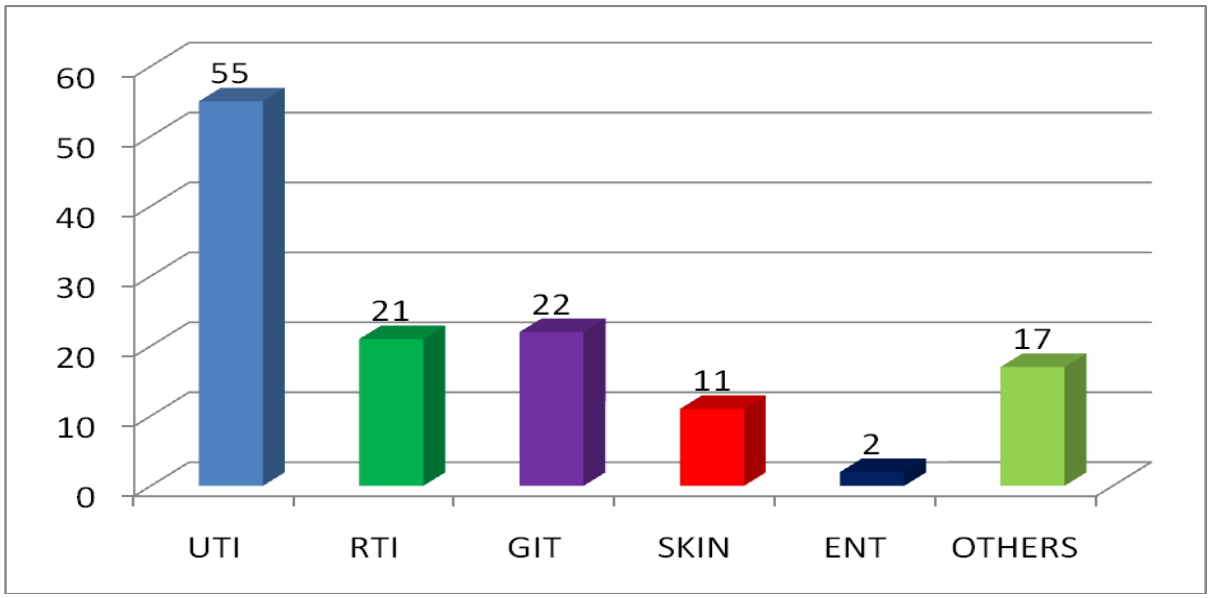


Figure - 2: Showing Timing of Infection.

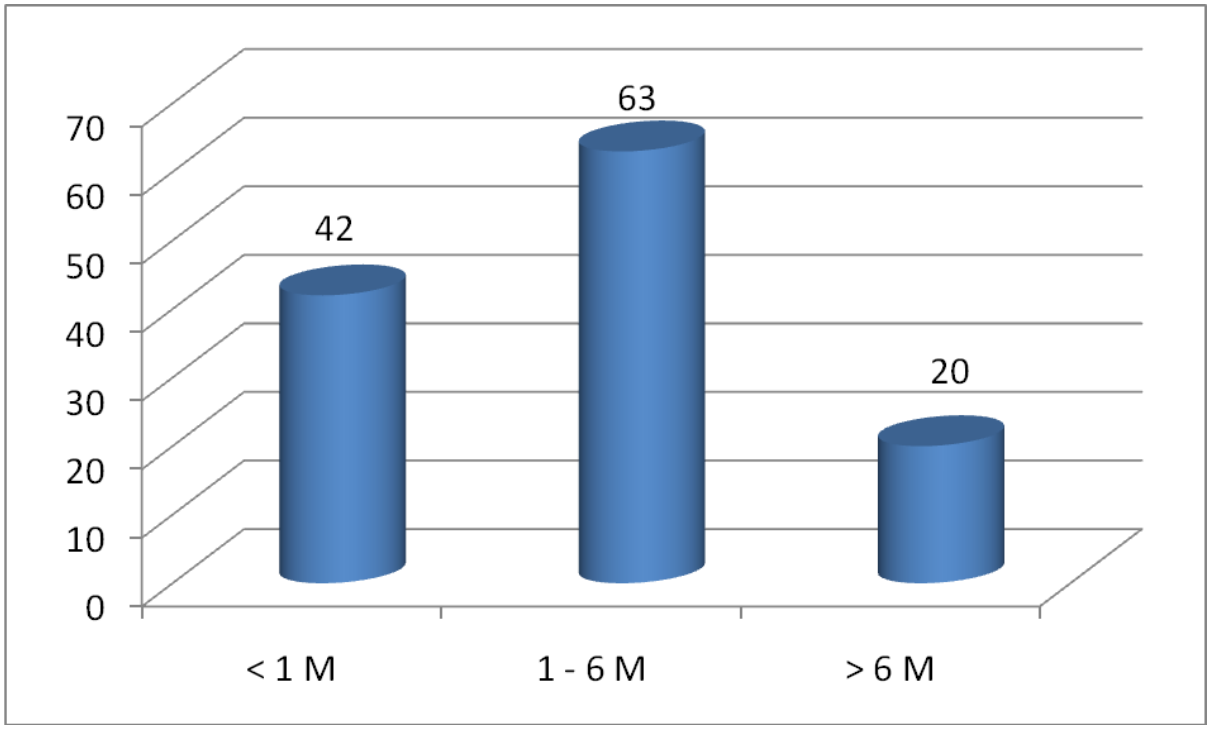


Figure - 3: Showing Nature of Infections.

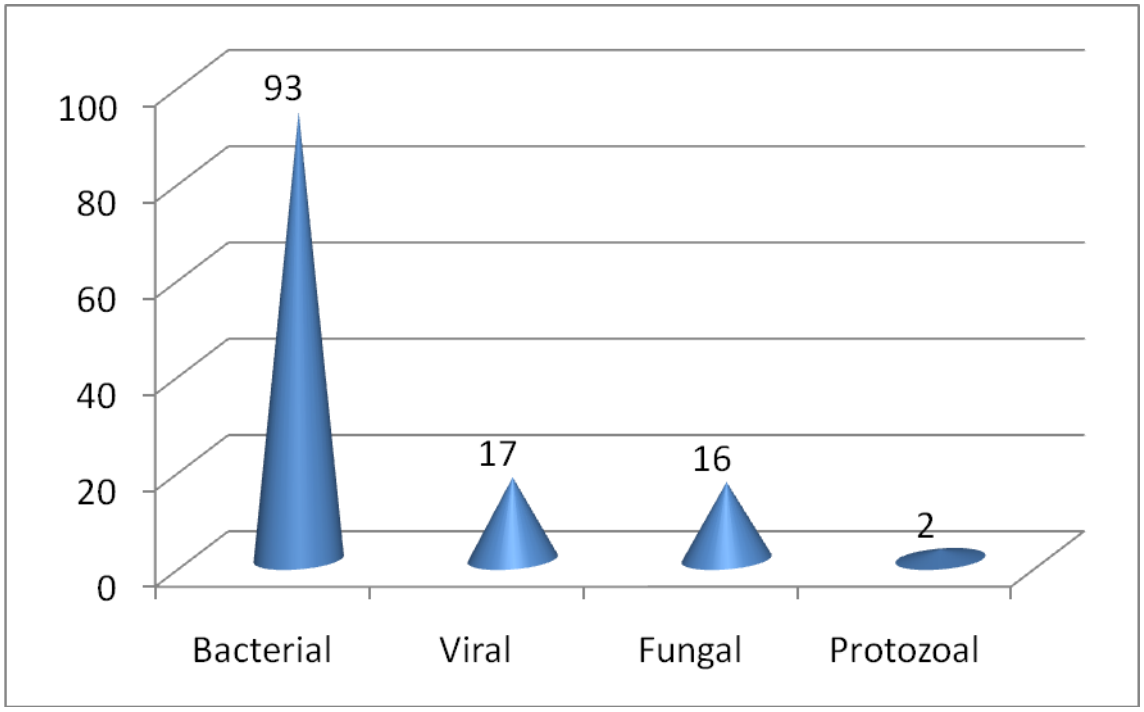
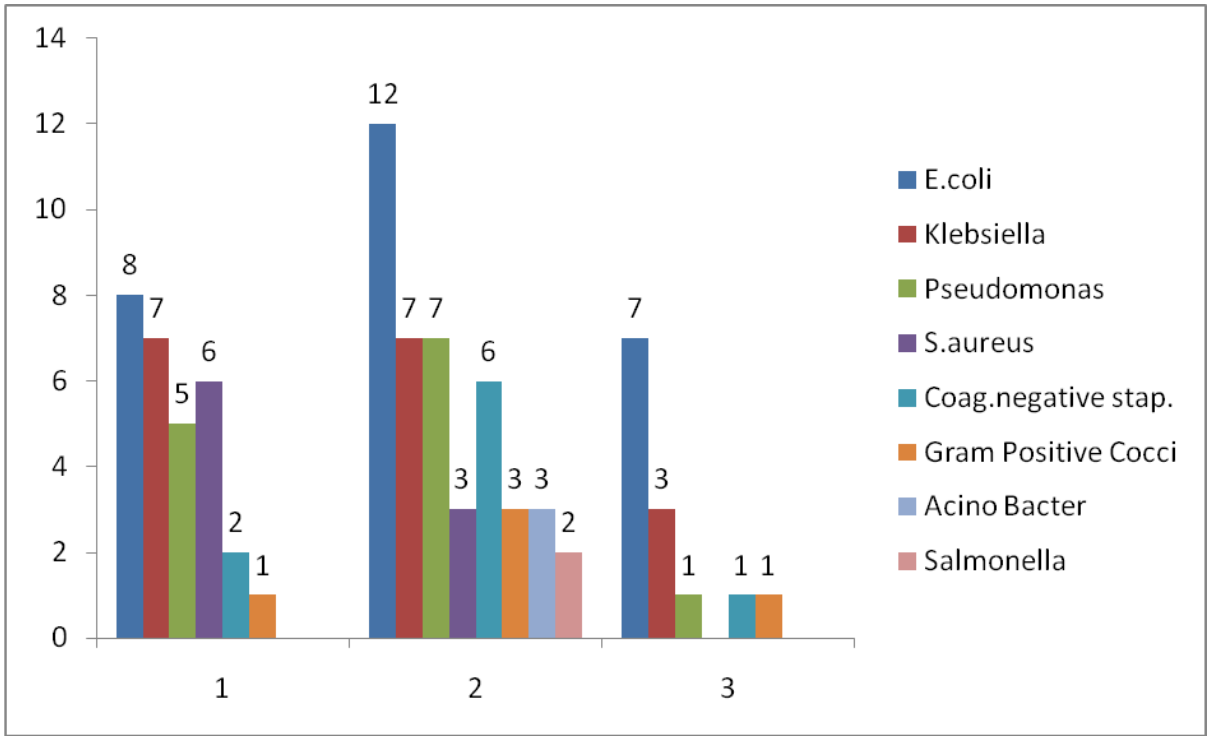


Figure - 4: Showing Bacterial Infections.



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complications associated with transplantation an analysis of risk factors. Yale J Biol Med., 1978; 51(5): 513-25.
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Figure - 5: Showing Viral Infections

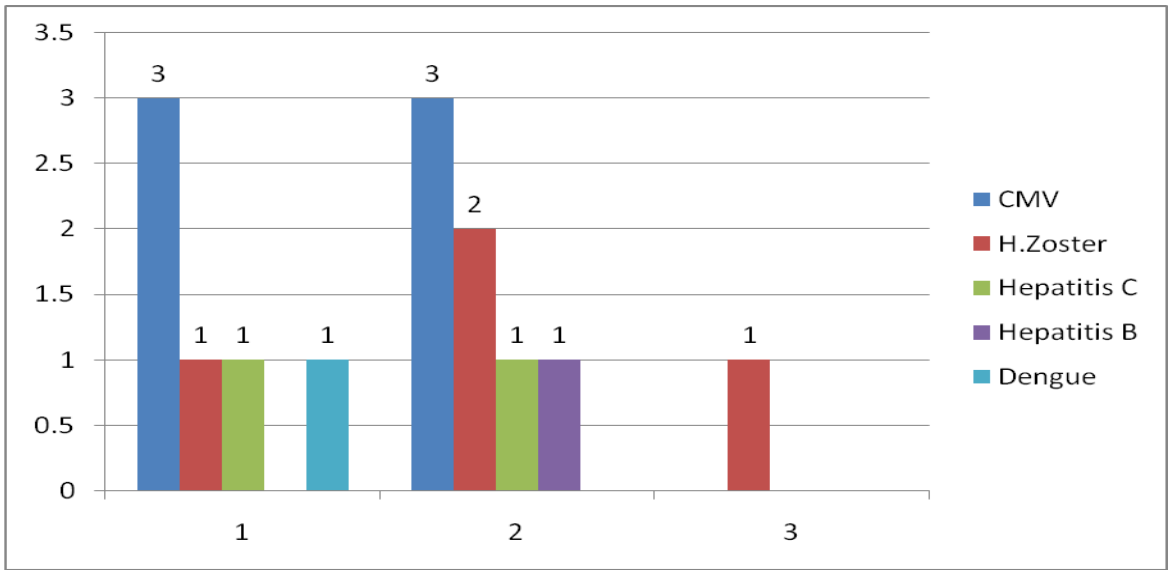

Figure - 6: Showing Fungal and Protozoal Infections.