

EVALUATION OF INFECTION IN FIRST THREE MONTHS OF RENAL TRANSPLANT – A HOSPITAL BASED STUDY

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Abstract

Background: The success of renal transplantation depends on a compromise between achieving sufficient immunosuppression to avoid rejection of the graft and maintaining a sufficient level of immuno competence to protect the recipient from infection. This study was undertaken to find out the prevalence of infection of renal allograft, to determine cause of infection, isolation of organism, antibiotic sensitivity and to evaluation of fate of infection within first three months of post transplant period.

Methods: All the subjects of this study had received live related renal transplantation. Triple immunosuppressive therapy was started day before transplantation. Before enrollment in this study, all base line investigations of recipient and donor were done. All the patients were investigated at 3rd, 7th, 14th, 21st, 28th day, end of 2nd and 3rd month and whenever infection was suspected any time within first 3 months of transplantation. Patients of primary graft failure were excluded from this study. Results were expressed as mean \pm standard deviation (mean \pm SD). Fisher exact test or chi-square tests were performed for data analysis. All analysis were done using SPSS windows package and p value <0.05 were considered significant.

Results: In the present study, 71% patients had suffered from infection within first 3 months of post transplant period. Among them 71% occurred during hospital stay. Infection rate was 62% at the first month followed by 25% in 2nd month and 13% at 3rd month. Ninety six percent causes were bacterial infection and 4% were viral infection. Bacterial infection included urinary tract infection (79%), respiratory tract infection (6%), septicaemia (7%) and wound infection (4%). During follow up, most of the UTI were of bacterial origin, male and female had suffered from similar incidence of UTI (72% vs 69%), that was statistically insignificant (p=NS). Most of the episodes of UTI (90%) were associated with bacteriuria caused by *E.coli*.

Conclusion: In the present study showed that, infection was the most common complication within first 3 months of transplant patient. UTI was the most common and remains major cause of morbidity of renal transplant recipients.

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Introduction

Improvements in general clinical care arising from greater experience, improvements in methods of organ procurement, surgical technique, recipient selection and a greater awareness of the type and timing of infections, the incidence of lethal and non lethal infections

decreased significantly. The success of renal transplantation depends on a compromise between achieving sufficient immunosuppression to avoid rejection of the graft and maintaining a sufficient level of immuno-competence to protect the recipient from infection. Despite this success, infection still

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occurs in more than two thirds of transplant recipients and remains the leading cause of death in this patient population¹. In our country, data regarding infection of renal allograft recipient at earlier post transplant period are scarce. Therefore, the present study was carried out to find out the prevalence of infection, determine the cause of infection, isolation of causative organisms and their susceptibility pattern to common antimicrobial agents as well as type and consequence of infection of renal allograft recipient.

Methods:

Type, place and period of study: This prospective randomized clinical study was carried out in the Dept. of Nephrology, BSMMU, Dhaka, over a period of two years from January 2002 to December 2003.

Study Population: Total number of patients were 31 (n = 31), 18 males and 13 females with mean age 27± 8.8 yrs were included in this study. All patients received live related renal transplantation. They were studied prospectively for 3 months after transplantation.

Exclusion Criteria: Subjects who had primary graft failure after transplantation.

Immunosuppression: Triple immunosuppressive therapy, started day before Transplantation. Acute Rejection was treated by 500mg Methyl prednisolone for successive 3 days.

Per operative antibiotic prophylaxis and postoperative care: All patients received 1gm intravenous ceftriaxone in peroperative period. Patients did not receive prophylactic agents for CMV and *Pneumocystis carinii* but isoniazid was given for those patients who were suffering from tuberculosis previously and mantoux test revealed >5mm induration . After discharge from hospital, patients were regularly seen at the out patient department and when indicated, culture and other diagnostic measures were performed.

Operational Definitions:

Infectious episode was used to indicate every episode of presumed or proved infection. Five

groups of infectious diseases were distinguished: urinary tract infections (UTIs), respiratory tract infections (RTIs), septicaemia, wound infections and viral (CMV) infections.

UTI : Although the presence of bacteriuria with a concentration of at least 10⁵ organism per ml. in the midstream clean catch or catheterized sample of urine fulfilled the criteria for UTI in renal transplant recipients, other criteria such as pyuria (>10 pus cell/HPF) fever and dysuria were frequently used for diagnosing UTI. UTI was considered to be catheter related if infection occurred during urethral catheterization or within 24 hours after catheter removal with growth of organisms from catheter tip culture.

RTI were diagnosed according to respiratory sign symptoms with radiologic finding and positive sputum microscopic examination and culture.

Wound infection was defined as the presence of purulent discharge from a surgical wound with positive culture.

Septicaemia was defined as growth of organism on blood culture.

CMV disease was based on the presence of clinical symptoms (fever, arthralgia, myalgia and organ involvement) and detection of antigen or viral DNA of CMV from blood.

Results:

The results are given below:

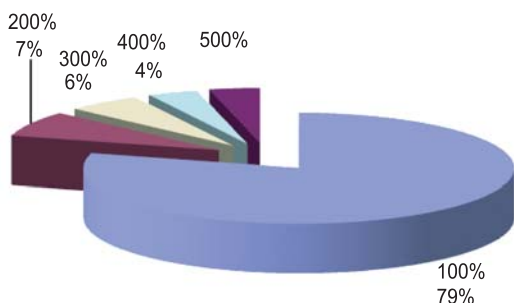
Complications at Earlier Post Transplant Period: Among all the studied patients, during observation period, infectious complications occurred in 22 (71%). Acute rejection and surgical complication were observed in 26% and 19% respectively (Table-I).

Table I
Early Complications of Transplant

Complication	No. of Patients	% of Patients
Infection	22	71
Acute Rejection	08	26
Surgical Complication	06	19

Types of infections (in First Three Months):

A total of 22 patients had suffered from different types of infection. Among them 42 (79%) episodes of UTI, 3 (6%) episodes of RTI, 2 (4%) episodes of wound infection and 4 (7%) septicaemia. Bacteria were responsible for 5 (96%) episodes and 2 (4%) were due to vire infection (Fig. 1).



- 1= Urinary Tract Infection
- 2=Septicaemia
- 3= Respiratory Tract Infection
- 4=Wound Infection
- 5= Viral Infection

Fig.-1: Type of Post Transplant Infections

Organisms isolated: During the first 3 months of post transplant period, among the 31 transplant recipients, 11 suffered from single episode and another 11 suffered from two or more infectious episodes. Five types of pathogens were isolated by culture from different specimens at different times. Among them *E. coli* were 50 (77%), *Pseudomonas* 6 (9%), *Klebsiella* 5 (8%), *Staphylococcus* 3 (4.5%) and *Enterococcus* 1 (1.5%) (Figure 2).

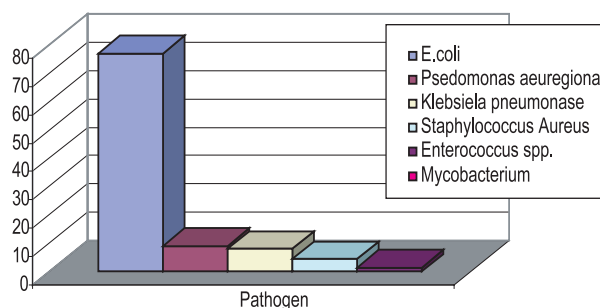
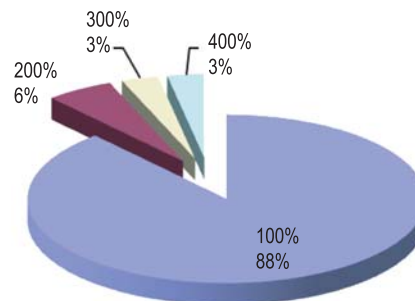


Fig.-2: Organisms Isolated

Organism causing UTI:

The bacterial cause of UTI was 38 (90%). Among them *E. coli* 34 (88%) *Klebsiella* 2 (6%), *Pseudomonas* – 1 (3%) and *Enterococcus* – 1

(3%). Only 2 episodes of UTI were associated with septicaemia (Figure 3).



- 1= *E.coli*
- 2= *Klebsiella*
- 3= *Pseudomonas*
- 4= *Enterococcus*

Fig.-3: Organism Causing UTI

Discussion

With increasing experience, renal transplantation now offers equivalent or better patient survival than haemodialysis. Recipients of renal allograft in developing countries may be more prone to certain complications contributing to the risk for infection²⁻⁴. In the present study, 71% patients had suffered from infection within first 3 months of post transplant period. Among them 71% occurred during hospital stay. Infection rate was 62% in the first month followed by 25% in 2nd month and 13% at 3rd month. Ninety six percent causes were bacterial infection and 4% were viral infection. Bacterial infection included urinary tract infection (79%), respiratory tract infection (6%), septicaemia (7%) and wound infection (4%). During follow up, most of the UTI were of bacterial origin, male and female had suffered from similar incidence of UTI (72% vs 69%), that was statistically insignificant. Most of the episodes of UTI (90%) were associated with bacteriuria caused by *E.coli*. The occurrence of UTI was associated with the duration of urethral catheterization. Mean duration of urethral catheterization was 11.8±6.5 days. Incidence of UTI increased significantly when the duration of urethral catheterization was more than 7 days. Similar incidence of UTI was found in ureteric stented and non stented patients (73% vs 69%) which was statistically insignificant. The patients, who were not stented, had more urological complications and more incidence of UTI. In the present study, *E.*

coli was the commonest isolated pathogen constituting 77% and sensitivity pattern revealed that, all isolates were sensitive to ceftriaxone, ciprofloxacin and ceftazidime, in between 67 to 100% except *Pseudomonas*, which was 33% sensitive to ceftriaxone and ciprofloxacin and 50% to ceftazidime. Pathogens showed higher resistance to ampicillin, cotrimoxazole and cephadrine like above mentioned study. There were only 6% RTI, mostly caused by *Klebsiella pneumoniae* followed by mycobacterium tuberculosis. Four percent had wound infection and 7% septicaemia. There were two episodes of sepsis followed by UTI. There were two (4%) episodes of viral infection, both were CMV infection and occurred at 3rd month of post transplant period. No case of invasive fungal disease or pneumonia caused by *Pneumocystis carinii* were detected. Maraha et al.⁵ reported that 60% of all infections were UTI, male and female had suffered from UTI 70% and 42% respectively. Fifty four percent had single episode and 46% had recurrent UTI. 83% UTI presented with bacteriuria. In the present study, there were two cases of pneumonia caused by *Klebsiella pneumoniae* at the end of first month of transplantation and no case of *Pneumocystis carinii* was detected by regular screening of sputum by Giemsa staining. Renal transplant patients developed tuberculosis as reported earlier are 12% in Indian subcontinent³, 3.5% in Saudi Arabia⁶, 3.64% in Argentina⁷, 0.8% in Spain⁸ and 1.7% in United Kingdom⁹. Rashid et al.¹⁰ showed that incidence of tuberculosis was about 6% in Bangladesh among transplant recipients. The interval between development of tuberculosis in post transplant period varies from 1 month to 10 years^{3,11}. In the present study, a single case had suffered from milliary tuberculosis at 3rd month of transplantation, diagnosed by microscopic examination of sputum. The incidence of wound infection was low (4%) in the present study, as in other recent studies^{12,13}. In the present study, two episodes or 4% of all infection had suffered from CMV infection. One of which was primary infection and the other was reactivation. One case was presented with concomitant acute rejection and sepsis. Incidence of sepsis was 4 (7%), that occurred during hospital stay after transplantation. None of the patients had invasive fungal disease other than

oropharyngeal candidiasis. Acute rejections occurred in 8 (26%) cases

Conclusion

From this study, considering all parameters, it can be concluded that, infection is the commonest complication in transplant patient within 1st three months of transplantation. Most cases of mortality were associated with infection and CVD.

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