

Recurrent urinary tract infection among renal transplant recipients: risk factors and long term outcome

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Abstract

Urinary tract infection (UTI) is the most common type of bacterial infection contracted by recipients of renal allograft and may have an adverse impact on graft and patient's survival. **Aim of the study:** We aimed to evaluate the risk factors of recurrent UTI in renal transplant recipients, and its impact on patient and graft survival. **Result:** An eighty six per cent of 1019 patients (who were transplanted between 2000 to 2010 in Hamed Al-Essa organ transplant center of Kuwait) developed at least one episode of UTI however; only 6.2% patients had recurrent UTI. We compared the patients who had recurrent UTI (group 1) and those who had no or non-recurrent UTI (group 2) against their risk factors. Patients of group 1 were significantly younger than those of group 2 (34.9 ± 23 vs. 42.8 ± 16 year, $p < 0.001$ respectively), with female preponderance ($p < 0.001$). The percentages of thymoglobulin induction (21.5%) were significantly higher in group 1. Patients with pretransplant urological problems experienced significantly more recurrent UTI ($p < 0.0001$). Hepatitis C patients were significantly more prevalent among group 1 (10.8% vs. 3.8%, $p = 0.008$). Long term graft outcome (functioning, failed and lost follow up) were 78.5%, 21.5 and 0% vs. 84.5, 13.9 and 1.2% respectively ($P = 0.18$). The patient outcome (live, dead and lost follow up) were 73, 1.6 and 25.6% vs. 62.1, 0.3 and 33.6% respectively ($P = 0.187$). **Conclusion:** Adult age, female sex, thymoglobulin induction, pretransplant urological problems and hepatitis C infection were considered risk factors of recurrent UTI among our renal transplant recipients. However, recurrent UTI did not adversely impact graft or patient survival. Key words: Recurrent UTI, kidney transplant, outcome

Introduction :

Kidneys are the most frequently transplanted solid organs, and transplantation rates would be even higher if donor supply matched demand. Since the first successful renal transplantations were performed in the 1950s, understanding of the factors that improve graft outcome has advanced. Nevertheless, post-transplantation urinary tract infections (UTIs) continue to be a source of morbidity and graft failure. (1) Urinary tract infection (UTI) is the most common type of bacterial infection contracted by recipients of renal allograft in the post transplantation period. (2) Fungi and viruses can also cause UTIs, but infections caused by these organisms are less common than those caused by bacteria. The reported incidence varies widely, likely due to differences in definition, diagnostic criteria, study design, and length of observation. The typical micro-organisms causing post transplant UTI are enteric gram negative bacilli and Enterococci, in addition to

Klebsiella pneumonia and pseudomonas. (5) UTI may have an adverse impact on graft and patient's survival. Robust definitions of UTI, bacteruria, bacteremia and pyuria are important so that clinicians can communicate accurately.

Aim of Work: To evaluate the risk factors of recurrent urinary tract infection in renal transplant recipients followed up in Hamed Al-Essa Organ transplant center (OTC) of Kuwait, and to assess its impact on patient and graft outcomes.

Patient and method

This study was comprised of 1019 kidney transplant recipients who received their grafts and followed up in OTC of Kuwait during the period between the years 2000 to 2012. We evaluated them for the possible risk factors of recurrent UTI as: age, gender, pre-transplant urinary tract abnormalities, re-transplantation, type of induction and maintenance immunosuppression, associated co-morbidities as pre-transplant diabetes mellitus, new onset diabetes after transplantation, ischemic heart disease, donor age and sex in addition to viral infections especially hepatitis C, hepatitis B, CMV infections. All women were assessed gynecologically to exclude genital infections. Each case of recurrent UTI underwent repeated urine analysis and culture. A positive culture was considered when bacterial counts were more than 10^5 cfu/ml. All patients were evaluated by plain x-ray abdomen (KUB), abdominal ultrasound, computerized axial tomogram for the abdomen (CT abdomen), radionuclide scan using gallium isotope, micturating cystourethrogram (MCUG).

Result :

1019 renal transplant recipients who underwent renal transplantation during the period between 2000 till 2012 in OTC were included in this study. Of these patients, 847 (86%) patients developed at least one episode of UTI but only 64 patients (6.2%) have developed recurrent UTI. We compared the patients who had recurrent UTI (group 1) and those who had no or non-recurrent UTI (group 2) against their risk factors. Patients of group 1 were significantly younger than those of group 2 (34.9 ± 23 vs. 42.8 ± 16 years, $p < 0.001$ respectively). We found that the percentages of patients who received no induction (9.9%) or thymoglobulin induction (21.5%) were significantly higher in group 1; while those who received IL-2 receptor blockers (basiliximab 30.2.2%) or ATG 38.1%) were significantly higher in group 2 ($p = 0.002$). Moreover, we found no significant differences between the two groups regarding mean number of HLA mismatches ($p = 0.17$) or the type of maintenance immunosuppression ($p = 0.5$). Regarding the original kidney disease, we observed that the percentage of patients with pretransplant urological problems experienced significantly more recurrent UTI ($p = 0.000$). We found that hepatitis C was significantly more prevalent among patients in group 1 (10.8% vs. 3.8%, $p = 0.008$); but we found no significant difference between the two groups regarding cases with HBV, CMV or BK viruses ($p > 0.05$). Also, the two groups were comparable regarding cases with osteoporosis ($p > 0.05$). Regarding long term graft outcome (functioning, failed and lost follow up) were studied in both group, The results were 78.5% in group 1 Vs 84.5% in group 2, 21.5% in group 1 Vs 13.9% in group 2 and 0.0% in group 1 Vs 1.2% in group 2 respectively ($P = 0.18$). Regarding patient outcome (live, dead and lost follow up) also were studied in both groups the results were as follow: 73% in group 1 Vs 62.1% in group 2, 1.6% in group 1 Vs 4.3% in group 2 and 25.6% in group 1 Vs 33.6% in group 2 ($P = 0.187$)

Conclusion:

Adult age, female sex, induction immunosuppression use, pretransplant urological problems and hepatitis C infection are considered risk factors of development of recurrent UTI. Recurrent UTI carry risk factor for development of acute kidney injury, septicemia, hospital admission and increased morbidity but did not show any increased short term or long term adverse effect on graft and patient survival if they are treated promptly

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