

## Recurrent urinary tract infections are associated with significantly worse renal transplant function

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**Background:** Urinary tract infections (UTIs) are the commonest infection affecting kidney transplant recipients (KTRs). Transplant pyelonephritis has a negative effect on long term graft survival. A proportion of these patients have recurrent infection or persistent infection with relapse on stopping antibiotics. Despite being an important clinical problem the incidence of recurrent and antibiotic treatment failure is not known.

**Method:** The study was a retrospective cohort study of KTRs admitted to a single transplant centre from 1st January 2012 to 31st October 2019. Information on all admissions coded for UTI in KTRs was collated, and subdivided into individuals with (a) single admission or (b) multiple admissions, whether separate episodes or re-admissions (<1 month) indicating a possible recurrence of the infection of the index admission. Individuals with a re-admission within one month due to a UTI were matched to individuals with a single UTI, according to age, gender and transplant age. Data was collected on demographics, biochemistry, microbiology and transplant outcome. Statistical analysis of normally distributed data was performed using chi squared and t-tests.

**Results:** Within the studied time period, there was an average 126 hospital admission per year due to UTI or pyelonephritis. Of these, 394 (41.7%) individuals had a solitary episode of UTI necessitating admission. There were a further 551 episodes affecting 169 individuals. Fifty five (9.8%) individuals were re-admitted with a further UTI within one month of index admission suggestive of treatment failure, and of these, 11 (20%) had more than one re-admission.

Those who were re-admitted within one month, with presumed treatment failure, in comparison to those who had a single admission had a trend towards a higher creatinine at baseline (mean 232 versus 194 $\mu$ mol/l,  $p=0.16$ ). The mean creatinine did not change significantly at re-admission (mean 220  $\mu$ mol/l,  $p=0.39$ ). Long term however outcome was significantly worse with only 34/55 having a functioning transplant (control group 52/55,  $p=0.001$ ). The mean GFR in those KTR with a functioning graft was 48.5mls/min in the cohort with recurrent UTIs versus 53.0mls/min in the control group ( $p=0.32$ ).

The index admission was also comparable between the groups with organisms identified in 33/55 of the cohort versus 36/55 of the control ( $p=0.55$ ) and neither did duration of antibiotic treatment between the groups (recurrent UTI cohort 11.3 days versus control 13.6 days,  $p=0.70$ ).

**Discussion:**

UTI recurrence, after initial treatment failure, is an important cause of morbidity and long term associated with a significantly worse graft outcome. Ensuring adequate duration of antibiotic treatment and resolution of the underlying risk factors should be integrated within routine care to reduce the risk of UTI recurrence.