Spectrum of Urinary Tract Infections in Post Renal Transplant Recipients

WCN25-AB-2079

Dr Rohan Arya[1] Dr Vishal Singh[1] Dr P Manu Dogra[1] Dr Indranil Ghosh[1] Dr Sreenivasa S[1] Dr Gurpreet Singh[2]

[1] Dept of Nephrology, Army Hospital Research & Referral, Delhi Cantt

[2] Epidemiologist, 28 Wing Hospital, Hindan

Background

Urinary tract infections (UTI) are the most common infections after kidney transplantation. The reported incidence of UTI post transplant is from 4-75% varying from center to center.

Aim

To detect the incidence and spectrum of UTI in post renal transplant recipients

Objectives

The ascertain the factors affecting the incidence of UTI and their significance

Methods

Study design: retrospective observational study

Duration: 1st January 2023 to 31st December 2023

Methodology: All kidney transplant recipients' treatment charts were analyzed for episodes of UTI and other associated factors were analyzed

Recipient factors: age, gender, basic disease (diabetes vs non diabetes)

Treatment factors: immunosuppression, duration of foley's catheterization in post transplant period, instrumentation of urinary tract post transplant and structural abnormalities

We also analyzed incidence of UTI episodes in ≤6 months and prevalence of causative microorganisms for UTI.

Definitions

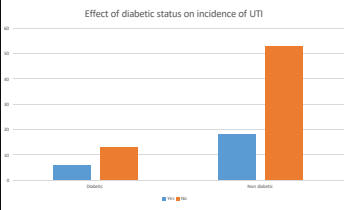
Urinary Tract Infection: An infection causing signs and symptoms of cystitis or pyelonephritis including the presence of signs of systemic inflammation, which is documented to be caused by an infectious agent

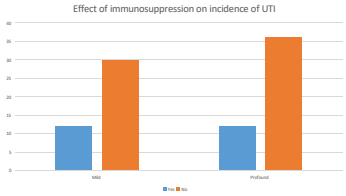
Upper UTI: A UTI process involving kidney and ureter is an upper UTI

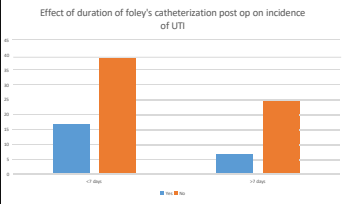
Lower UTI: A UTI process involving urinary bladder and urethra is a lower UTI

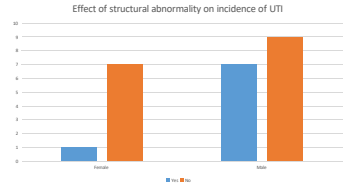
Results

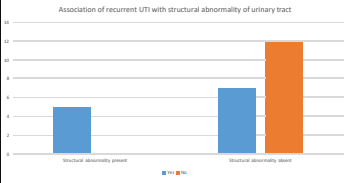
- 24/90 (27.8%) patients had UTI with M:F ratio 2:1.
- 7/24 patients who were age >40 years had developed UTI.

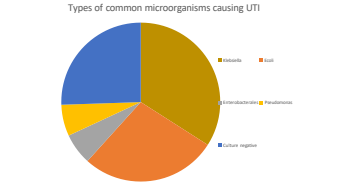


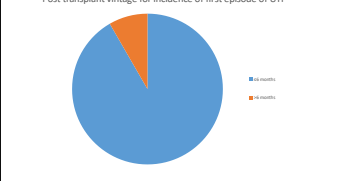


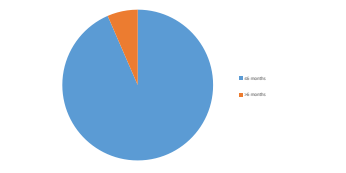












- 5/90 patients had undergone urinary tract instrumentation post renal transplant per indication, of which all had developed urinary tract infection.

Statistical Analysis

- Those who were on foley's catheterization for ≤7 days, 17/56 had developed UTI and those who were on foley's catheterization for >7 days, 7/25 had developed UTI (p = 0.4, pearson's chi squared test)
- Those who had diabetes mellitus, 6/19 (32%) had developed UTI, whereas those who were non diabetic 18/71 (25%) had developed UTI (p = 0.6, pearson's chi squared test)
- Those who had received Rituximab and/or rATG as induction, 27/63 (43%) UTI episodes were noted amongst them. Those who had received Basiliximab as induction amongst 20/50 (40%) UTI episodes were noted amongst them. (p = 0.8, pearson's chi squared test)
- Those males who had developed UTI 7/16 (43.7%) had structural abnormalities of lower urinary tract, whereas those females who had UTI 1/8 (12.5%) had structural abnormalities of lower urinary tract (p = 0.19, fisher's exact test)
- Amongst all UTI episodes 12/47 (26%) were culture negative, whereas 35/47 (74%) were culture positive. Out of all culture positive, 16/35 (45.7%) were Klebsiella pneumoniae, 13/35 (37.1%) were Escherichia coli, 3/35 (8.6%) were Enterobacterales and 3/35 (8.6%) were Pseudomonas aeruginosa.
- Amongst all UTI episodes 19/47 (40%) involved lower urinary tract, whereas 26/47 (60%) involved upper urinary tract.

Discussion

- 2/24 (8.3%) had their first episode after 6 months of transplant
- Amongst all UTI episodes 41/47 (87.3%) had occurred within first 6 months of transplant, whereas 3/43 (6.5%) occurred after 6 months of transplant
- Major risk factors for UTI are

1) Male sex
2) Age >40 years
3) High net immunosuppression in early post transplant period
4) Prolonged indwelling foley's catheter in early post transplant period
5) Structural abnormality of urinary tract
6) Diabetes Mellitus/NODAT

- However, all these factors were not of statistical significance in our patients except for the structural abnormality of urinary tract in male patients.
- Common organisms causative for UTI are Klebsiella Pneumoniae and Escherichia Coli which form ~3/4 of all Culture positive UTI with Enterobacterales being 3rd Most common organisms. Upper UTI are treated mostly with Carbapenems and Beta Lactams, whereas lower UTI were treated with nitrofurantoin and fosfomycin.
- It was also noted that those with recurrent UTI had significantly compromised creatinine clearance owing to residual structural damage to the renal parenchyma, which adds on to the morbidity.

Conclusion

- Post renal transplant UTI is a very common infection, which can lead to substantial increase in hospitalization and morbidity.
- It can be reduced with minimization of manipulation/instrumentation of the urinary tract, minimization of immunosuppression, good diabetic control.
- Most common microorganisms implicated in UTI are enterobacteriaceae, hence good hygienic practices is also important to prevent UTI in post renal transplant recipients.

References

Danovitch G. M., et al, Handbook of Kidney Transplantation 6e

Van Delden C., Stampf S., et al. Burden and timeline of infectious diseases in the first year after solid organ transplantation in the Swiss transplant cohort study. *Clin. Infect. Dis.* 2020;71:e159–e169. doi: 10.1093/cid/ciz1113.

O'Connell K., Kennedy C et al., Surveillance of common infections in the early period after renal transplantation in a national center: 2014–2017. *Transpl. Infect. Dis.* 2020;22:e13261.

Hollyer I et al., The challenge of urinary tract infections in renal transplant recipients. *Transpl. Infect. Dis.* 2018;20:e12828. doi: 10.1111/tid.12828.

Correspondence e-mail address
ronarya1192@gmail.com