Supplementary Materials and Methods

This retrospective descriptive study describes kidney transplant recipients (KTR) from IQRAA International hospital and research centre, Calicut, India, who developed UTI in the first 6 months post-KT. All patients with culture-proven asymptomatic bacteriuria in the first month, lower UTI or graft pyelonephritis in the first 6 months post-KT were included in the study. Cases were screened from the databases of hospital-information- systems. The details of GN bacterial isolates and AMR patterns were compared over the years 2017-2023.

Urine samples obtained either midstream or by aspiration from the Foley's catheter underwent standard microbiological analysis. Growth of $\geq 10^5$ CFU/ml was deemed significant. Extended spectrum beta Lactamase (ESBL) patterns were identified using double disk synergy testing.

Data analyzed using EZR software[4] involved univariate and year-wise bivariate frequency analysis for AMR of each microbe. Overall AMR was calculated by dividing the number of resistant isolates to the total isolates tested in each year. 95% confidence intervals (CI) were calculated for proportion of resistance of GN bacteria. Fisher exact test compared AMR distribution among microbes. Cochrane Armitage test for trend in proportion was used to test trend in ESBL in GNB across the years.

Supplementary References

S1.   Korth J, Kukalla J, Rath PM, Dolff S, Krull M, Guberina H, et al. Increased resistance of gram-negative urinary pathogens after kidney transplantation. BMC Nephrol. 2017 Dec;18(1):164.

S2.   Pérez-Nadales E, Fernández-Ruiz M, Gutiérrez-Gutiérrez B, Pascual Á, Rodríguez-Baño J, Martínez-Martínez L, et al. Extended-spectrum β-lactamase-producing and carbapenem-resistant Enterobacterales bloodstream infection after solid organ transplantation: Recent trends in epidemiology and therapeutic approaches. Transpl Infect Dis. 2022 Aug;24(4):e13881.

S3.   Singh J, De Jesus M, Cooper L, Pozzerle J, Antony SJ, Knight B. Clinical Features and Outcomes in ESBL-Producing Microorganisms in Renal Transplant Recipients with Urinary Tract Infections. Int J Infect [Internet]. 2019 Oct 2 [cited 2023 Nov 12];6(4). Available from: https://brieflands.com/articles/iji-96442.html

S4.	Martin A, Fahrbach K, Zhao Q, Lodise T. Association Between Carbapenem Resistance and Mortality Among Adult, Hospitalized Patients With Serious Infections Due to Enterobacteriaceae: Results of a Systematic Literature Review and Meta-analysis. Open Forum Infect Dis. 2018 Jul 1;5(7):ofy150.

S5.	Melzer M, Petersen I. Mortality following bacteraemic infection caused by extended spectrum beta-lactamase (ESBL) producing E. coli compared to non-ESBL producing E. coli. J Infect. 2007 Sep;55(3):254–9.

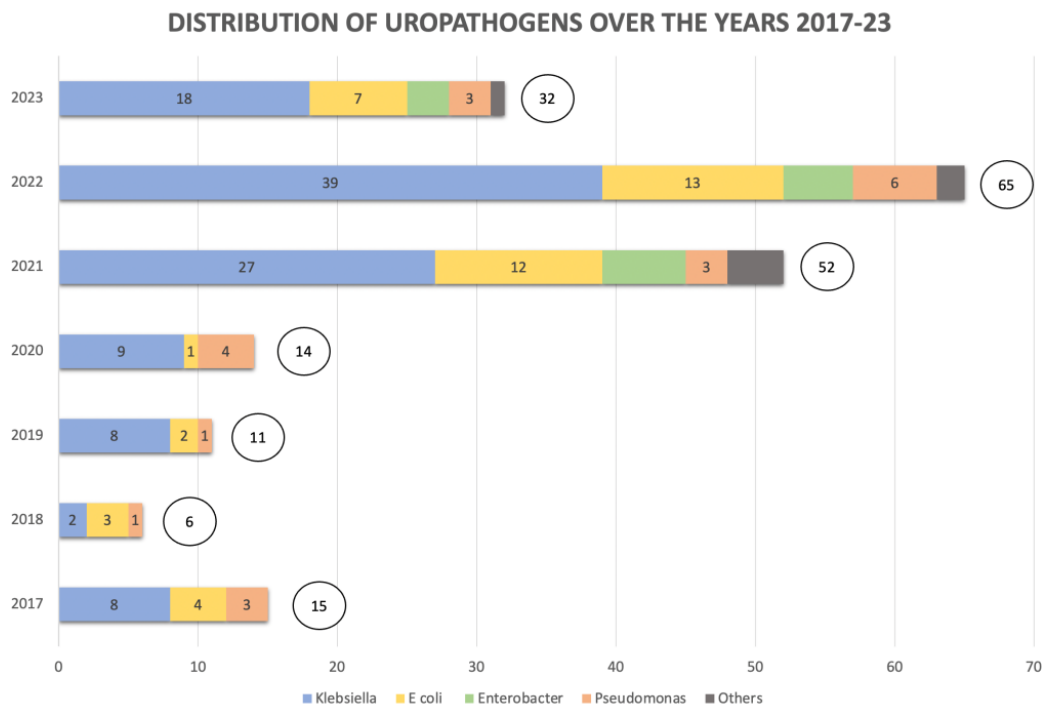Fig.S1 Distribution of uropathogens over the years 2017 - 2023

DISTRIBUTION OF UROPATHOGENS OVER THE YEARS 2017-23

Fig.S2 Antibiogram trend of GN uropathogens over the years 2017 – 2023.
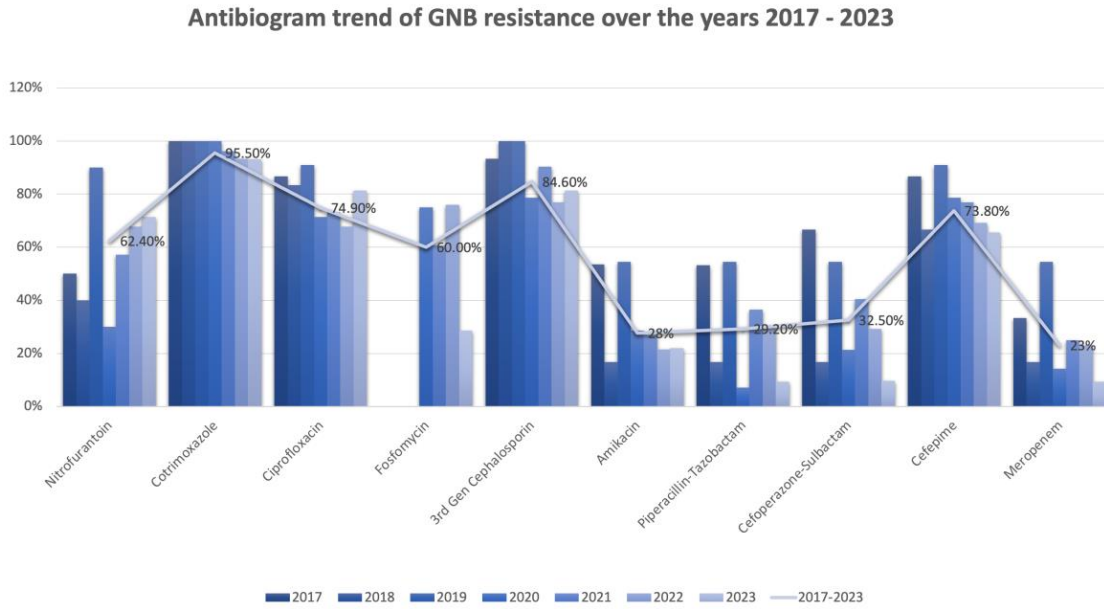GN: gram-negative, GNB: gram negative bacilli.

Antibiogram trend of GNB resistance over the years 2017 - 2023

Table.S1 Trend of AMR for various antibiotics over the years 2017 – 2023

	2017	2018	2019	2020	2021	2022	2023	2017-23
Total	15	6	11	14	52	65	32	195
Nitrofurantoin	6/12* (50%)	2/5 (40%)	9/10 (90%)	3/10 (30%)	28/49 (57.1%)	40/59 (67.8%)	20/28 (71.4%)	108/173 (62.4%)
Cotrimoxazole	15/15 (100%)	6/6 (100%)	10/10 (100%)	13/13 (100%)	50/52 (96.2%)	56/60 (93.3%)	27/29 (93.1%)	177/185 (95.7%)
Ciprofloxacin	13/15 (86.7%)	5/6 (83.3%)	10/11 (90.9%)	10/14 (71.4%)	38/52 (73.1%)	44/65 (67.7%)	26/32 (81.3%)	146/195 (74.9%)
Fosfomycin	ND	ND	1/1 (100%)	6/8 (75%)	20/33 (60.6%)	22/29 (75.9%)	2/7 (28.6%)	51/78 (65.4%)
3rd generation Cephaloporin	14/15 (93.3%)	6/6 (100%)	11/11 (100%)	11/14 (78.6%)	47/52 (90.4%)	50/65 (76.9%)	26/32 (81.3%)	165/195 (84.6%)
Amikacin	8/15 (53.3%)	1/6 (16.7%)	6/11 (54.5%)	4/14 (28.6%)	14/52 (26.9%)	14/65 (21.5%)	7/32 (21.9%)	54/195 (27.7%)
Piperacillin-Tazobactam	8/15 (53.3%)	1/6 (16.7%)	6/11 (54.5%)	1/14 (7.1%)	19/52 (36.5%)	19/65 (29.2%)	3/32 (9.4%)	57/195 (29.2%)
Cefoperazone-Sulbactam	10/15 (66.7%)	1/6 (16.7%)	6/11 (54.5%)	3/14 (21.4%)	21/52 (40.4%)	19/65 (29.2%)	3/31 (9.7%)	63/194 (32.5%)
Cefepime	13/15 (86.7%)	4/6 (66.7%)	10/11 (90.9%)	11/14 (78.5%)	40/52 (76.9%)	45/65 (69.2%)	21/32 (65.6%)	144/195 (73.8%)
Meropenem	5/15 (33.3%)	1/6 (16.7%)	6/11 (54.5%)	2/14 (14.3%)	13/52 (25%)	15/65 (23.1%)	3/32 (9.4%)	45/195 (23.1%)
Colistin	0/15 (0%)	0/6 (0%)	0/11 (0%)	0/14 (0%)	0/52 (0%)	0/65 (0%)	0/32 (0%)	0/195 (0%)
Ceftazidime-Avibactam	ND	ND	ND	ND	ND	6/6 (100%)	0/1 (0%)	6/7 (85.7%)
Synergy	ND	ND	ND	ND	ND	3/6 (50%)	1/1 (100%)	4/7 (57.1%)

*Number of resistant isolates/Total number tested (percentage resistant)

ND – Not done