

Evaluation of Rate and Risk Factors for Recurrence of Urinary Tract Infection After Severe Urinary Tract Infection Needing Hospitalization

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BACKGROUND

Urinary tract infections (UTIs) are considered as one of the the most common infections affecting around 150 million people worldwide every year. Studies on natural history show that 30%–44% of females suffering from an episode of acute cystitis will suffer from recurrent UTI, mostly within 3 months. Our study aimed to determine rate of recurrence of UTI within 3 months, microbiology profile of index and recurrent infection and risk factor related to recurrence after an episode of severe urinary tract infection requiring admission to hospital.

METHODS

We conducted a prospective observational study from March 2020 to November 2021. We included symptomatic patients with culture proven UTI requiring admission to Deenanath Mangeshkar Hospital and Research Centre in our study. Pregnant females and patients less than 18 years of age were excluded. At baseline, we recorded demographic factors, comorbidities such as presence of CKD, diabetes mellitus, prior history of catheterisation, prior history of UTI, history of organ transplantation, immunosuppressive medications and post void residual urine in bladder. We recorded microbiological profile of urine cultures of the index UTI. Patients were followed for 3 months for development of any symptoms consistent with UTI and accordingly urine cultures were sent. We defined recurrent UTI as an episode with symptoms consistent with urinary tract infection associated with positive urine culture occurring within three months of index UTI. We also separately defined asymptomatic bacteriuria as patients without symptoms of urinary tract infection but with positive urine culture with significant bacteriuria. Primary outcome measured was proportion of patients with recurrent UTI. We also determined risk factors for recurrent UTI using multivariate logistic regression analysis. We considered age, gender, presence of diabetes, chronic kidney disease, urinary tract abnormality, previous urinary catheterization, prior history of UTI, significant post void bladder residue and haemoglobin as potential risk factors for recurrence. We defined previous history of UTI as UTI within 1 year and previous history of catheterisation as catheterisation within 6 months.

RESULT

We included 275 patients who were admitted during the study period for UTI. Mean age of included patients was 61.5 years and 56% were male. Of the included patients, 50% were diabetic, 21% had CKD, 27% had urinary tract abnormality and 56% had previous history of catheterization. Table 1 shows baseline parameters of the included patients.

	Characteristics of Patient	Patients without recurrence (n =193)	Patient with Recurrent UTI (n=66)
1.	Age		
	<45 Years	43 (22%)	3 (5%)
	45-55 years	21 (11%)	14 (21%)
	>55 years	129 (67%)	49 (74%)
2.	Gender		
	Male	106 (55%)	40 (61%)
	female	87 (45%)	26 (39%)
3.	Mean age	60.20 ± 17.48	64.67 ± 11.30*
4.	Diabetes mellitus	90 (47%)	38 (58%)
5.	Chronic kidney disease	40 (21%)	16 (24%)
6.	Urinary tract abnormality	41 (21%)	25 (38%)*
8.	History of prior Catheterization	101 (52%)	44 (67%)*
9.	Previous History of UTI	48 (25%)	27 (41%)*
10.	Significant post-void residue	25 (13%)	12 (18%)
11.	Mean haemoglobin level	10.75 ± 2.14	9.83 ± 1.88*

Table 1. Basic characteristics of patients in non-recurrent and recurrent case group (* indicate p value <0.05)

Out of 275 index patients, 66 (24%) developed recurrent UTI, 16 (6%) developed asymptomatic bacteriuria and 193 (70%) did not have recurrence during a follow up period of 3 months. Most common pathogen observed for recurrence were E.coli (54.5%), Klebsiella pneumoniae (19.7%) and Enterococcus fecalis (12.2%) followed by Non albicans candida (7.6%) .

In univariate analysis, we found that age, urinary tract abnormality, prior history of catheterisation, prior history of admission with UTI and Haemoglobin were significantly associated with the risk of recurrent UTI. In multiple logistic regression analysis, urinary tract abnormality (p = 0.057) and Haemoglobin (p = 0.007) were found to be significant independent predictors of recurrence of UTI (Table 2).

	coefficient	Standard error	t stat	p-value
intercept	0.41	0.18	2.26	0.02
age	0.002	0.001	1.38	0.16
Urinary tract abnormality	0.13	0.06	1.91	0.05
Prior h/o catheterisation	0.04	0.06	0.73	0.46
Prior H/o admission with UTI	0.05	0.06	0.75	0.45
Haemoglobin	-0.03	0.01	-2.72	0.007

Table 2- Summary output

CONCLUSION

Recurrence of UTI after an episode of severe UTI is common, it was 24% in this study. Urinary tract abnormality and anemia are independent risk factors for recurrence of UTI.