

Profile of Catheter Vs Non-Catheter Urinary Tract Infections in a Tertiary Care Centre

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Abstract

Urinary tract infections (UTIs) are one of the most common hospital community-acquired infections (HCAI), with up to 70-80% attributable to the presence of indwelling urinary catheters.

Keywords: Catheter; Urosepsis; Nosocomial

Introduction

Catheter-associated urinary tract infection (CA-UTI) is defined as a urinary tract infection that occurs with the use of an indwelling urinary catheter. Urinary tract infections (UTIs) are one of the most common hospital community-acquired infections (HCAI), with up to 70-80% attributable to the presence of indwelling urinary catheters [1]. We did a comparative study of patients with urinary tract infection with or without catheter to look for additional associated risk factors, varying presentation, varying microbiological profile and treatment outcomes in both cases.

Materials and Methods

Hospital based prospective study involving Patients admitted in a tertiary care hospital, Sheri Kashmir institute of medical sciences soura, Srinagar.

Results

Patients of 60 years and above with catheter associated UTI were 59.8% (64) where as non-catheterized UTI were 18.2% (26).

The difference was statistically significant ($p: \leq 0.0001$) as majority of the catheterized population was elderly. A direct relationship exists between the cases with catheter associated urinary tract infection and the prevalence of hypotension and encephalopathy, (15.9% vs. 7%) and (30.8% vs. 2.8%) respectively. Fungal species were significantly high in catheterized patients (34.6% vs.7%). *Candida albicans* was the most common isolate from patients with catheter associated UTI (29.3% vs. 11.3%) whereas *E. coli* was the most common isolate from non-catheterized group (25.3% vs. 32.3%).

Discussion

Demography

Out of 250 total cases, 107 were catheterized during hospital stay. Patients of less than 30 years with Catheter associated UTI were 9.3% (10) where as non-catheterized UTI were 33.6% (48). Patients of 30-60 years with C-UTI were 30.8% (33) while non-catheterized UTI were 48.3% (69). Patients of 60 years and above

with catheter associated UTI were 59.8% (64) where as non-catheterized UTI were 18.2% (26). The difference was statistically significant (p: ≤0.0001) as majority of the catheterized population was elderly.

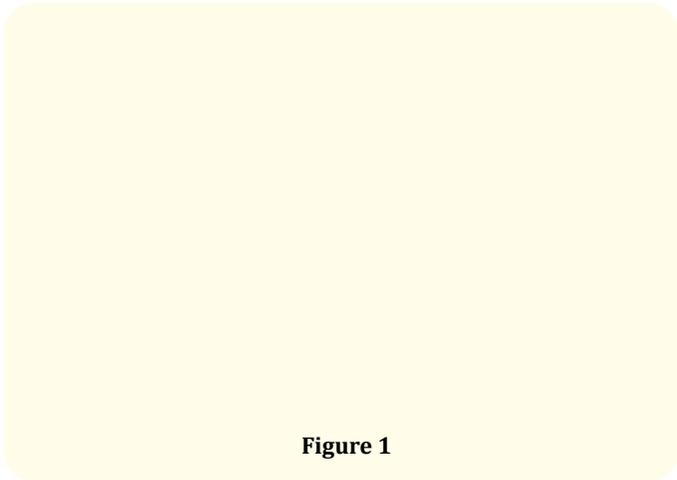


Figure 1

Clinical Presentation

In patients with catheter associated UTI, the duration of symptoms was comparatively more. Almost 41.5% catheterized cases were symptomatic for three weeks or more, in comparison to only 28.2% of non-catheterized group (P value: ≤0.0001). Predominant clinical presentation of catheter associated urinary tract infection group was fever (76.6%), followed by dysuria (51.4%). On comparing catheterized group with non-catheter, a statistically significant difference was seen with dysuria (51.4% vs. 81.8%) with Fisher’s Exact Test: ≤0.0001, fever (76.6% vs. 62.2%) with Fisher’s Exact Test: 0.019, hypotension (15.9% vs. 7%) with Fisher’s Exact Test: 0.038, encephalopathy (30.8% vs. 2.8%) with Fisher’s Exact Test: ≤0.0001. Thus a direct relationship exists between the cases with catheter associated urinary tract infection and the prevalence of hypotension and encephalopathy.

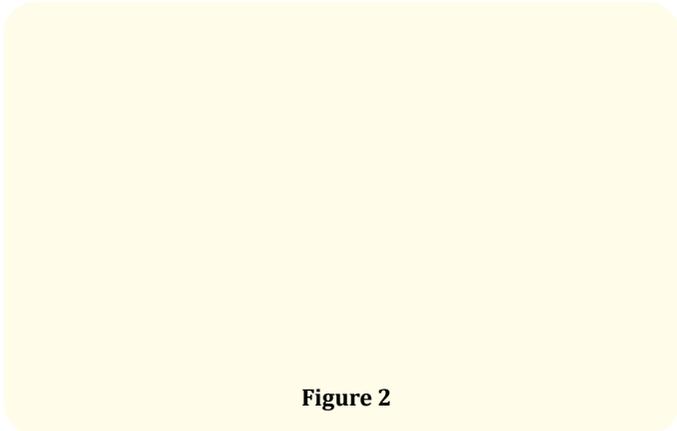


Figure 2

Risk factor

On risk factor analysis, we found diabetics more associated with catheter-associated UTI than non diabetics (50.5% vs. 22.4%), Fisher’s Exact Test: ≤0.0001.

Risk factor	Catheter associated uti cases	Noncatheter uti cases	Total cases	Fisher’s exact test
Diabetes				
Absent	53 49.5%	111 77.6%	164 65.6%	≤0.0001
Present	54 50.5%	32 22.4%	86 34.4%	
Total	107 100%	143 100%	250 100%	
Malignancy				
Absent	101 94.4%	127 88.8%	228 91.2%	0.175
Present	6 5.6%	16 11.2%	22 8.8%	
Total	107 100%	143 100%	250 100%	
Prostatomegaly				
Absent	94 87.9%	142 99.3%	236 94.4%	≤0.0001
Present	13 12.1%	1 0.7%	14 5.6%	
Total	107 100%	143 100%	250 100%	
Other risk factors				
Urinary calculus	1 0.9%	9 6.3%	10 4%	≤0.0001
Urological procedure	7 6.5%	6 4.2%	13 5.2%	
Steroids	48 44.8%	2 5.3%	50 20%	

Table 1

Microbiology

Urine culture positivity in catheter associated UTI is more (67.9% vs. 44.7%), P value: 0.001. Fungal species were significantly high in catheterized patients (34.6% vs.7%), Fisher’s Exact Test: ≤0.0001. Candida albicans was the most common isolate from patients with catheter associated UTI (29.3% vs. 11.3%) whereas

E. coli was the most common isolate from non-catheterized group (25.3% vs. 32.3%). The findings were different from the previous studies which showed *candida albicans* as third, most recent as second cause of catheter associated urinary tract infections [2].

Urine routine	Catheterized cases		Total cases
	Yes	No	
0-8 pus cells	11	16	27
	10.3%	11.2%	10.8%
8-30 pus cells	49	64	113
	45.8%	44.8%	45.2%
>30 pus cells	47	63	110
	43.9%	44.1%	44.0%
Total	107	143	250
	100.0%	100.0%	100.0%

Table 2

Chi-Square: 0.062; P value: 0.970.

Urine culture	Catheterized cases		Total cases
	Yes	No	
Positive	74	63	137
	67.9%	44.7%	54.8%
Negative	35	78	113
	32.1%	55.3%	45.2%
Total	109	141	250
	100.0%	100.0%	100.0%

Table 3

Chi-Square: 14.990; P value: 0.001.

Figure 3

Microorganisms	Catheterized cases		Total cases
	Yes	No	
<i>E. coli</i>	19	20	39
	25.3%	32.3%	28.5%
<i>Enterococcus faecalis</i>	7	16	23
	9.4%	25.8%	16.7%
<i>Klebsiella pneumonia</i>	5	6	11
	6.7%	9.7%	8.0%
<i>Enterobacter</i>	1	0	1
	1.3%	0.0%	0.7%
<i>Acinetobacter</i>	1	2	3
	1.3%	3.2%	2.2%
<i>Pseudomonas aeruginosa</i>	3	5	8
	4.0%	8.1%	5.8%
<i>Candida albicans</i>	22	7	29
	29.3%	11.3%	21.2%
<i>Non albicans candida</i>	15	3	18
	4.0%	0.0%	2.2%
<i>Staphylococcus aureus</i>	1	3	4
	1.3%	4.8%	2.9%
<i>Providencia</i>	1	0	1
	1.3%	0.0%	0.7%
Total	75	62	137
	100%	100%	100.0%

Table 4

Chi-Square: 22.586; P value: 0.067.

Figure 4

Outcome

Infection resolved in 52.5% of catheter associated UTI cases in comparison to 61.5% of non-catheterized, though the difference was statistically insignificant.

Recurrent infections	Catheterized cases			Total cases
	Yes	No		
Re-infections	4	11	15	15
	26.7%	50.0%	40.5%	40.5%
Relapses	11	11	22	22
	73.3%	50.0%	59.5%	59.5%
Total	15	22	37	37
	100.0%	100.0%	100.0%	100.0%

Table 5

Fisher’s Exact Test: 0.140.

Statistically significant outcomes of our study

- Elderly (above 60 years) were significantly involved.
- Majority of catheter associated UTIs were symptomatic for more than three weeks.
- Fever, hypotension, encephalopathy were significantly associated with catheter associated UTIs.
- Diabetes, prostatomegaly, use of steroids were major risk factors with catheter associated UTI.
- Urine culture was positive significantly in catheter associated UTIs.
- Urine catheters were major risk factors for fungal UTIs.

Conclusion

Catheter-associated UTIs account for 40% of all hospital-acquired infections and are thus the most common type of nosocomial infections. Overall, about 10% of patients with short-term catheterization develop infections. These may be an important reservoir for selection and transmission of multi-drug-resistant strains and are a frequent source of gram negative bacteremia in hospitalized patients [3].

Ethical Considerations

Study has been cleared by SKIMS Institutional Ethical Committee (IEC).

Statistical Analysis

The categorical variables were analyzed by Pearson’s Chi Square and Fisher’s Exact test using SPSS software version 22. P value less than 0.05 was considered to be statistically significant.

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