



CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI) IN ADULT POPULATION ACQUIRED DURING HOSPITAL STAY**

General Medicine

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ABSTRACT

One of the most prevalent health-related illnesses globally is catheter-associated urinary tract infection (CAUTI). CAUTIs account for most of hospital-acquired diseases. Most of the healthcare-acquired urinary tract infections result from catheter tubes insertion. These tubes connect a urinary bag and the urinary bladder via the urethra. These are known as indwelling urinary catheters or self retaining catheter. The length of catheterization has a key role in starting bacteriuria since biofilm eventually forms on all of these devices. Despite the low percentage of people with bacteriuria who start showing symptoms, there is nevertheless a significant risk associated with these contamination due to the repeated use of indwelling urinary devices. Minimizing indwelling device usage and stopping the catheter as soon as medically possible are the two most crucial preventative measures for bacteriuria and infection when device use is required. We should avoid catheter-acquired urinary infections must be implemented and monitored by infection control guidelines in healthcare institutions. These approaches include monitoring device use, the suitability of device justifications, and problems. We can bring down the increased incidences of catheter-associated urinary tract contamination by maintaining hygiene while handling the catheter and patients and keeping the infected patients away or isolated from unaffected patients as a precaution. This study mainly focuses on an overview that helps with discussing prevalence, risk factors, diagnosis, causes of CAUTI.

KEYWORDS

CAUTI, UTI

INTRODUCTION -

Urinary tract infection is consider when any of the following structures such as kidney, ureter, bladder, or urethrae get infected. If the microorganism is present in urine, then it is considered as Urinary tract infection.

Urinary tract infection is classified by Hospital in Europe Link for Infection Control through Surveillance (HELICS) as; UTI-A (symptomatic with microbiology confirmed urinary tract infection), UTI-B (symptomatic without microbiological confirmed urinary tract infection), and UTI-C (urinary tract infection with asymptomatic bacteriuria). In India it is simplified by Centers for Disease Control and Prevention (CDC) by bacterial growth in the urine culture. If we get the urine culture with $\geq 10^5$ colonies forming units (CFU)/ml urine with presence of one or two of microorganisms, and with or without clinical features then it is consider as Urinary tract infection. The presence of a urinary catheter for an extended period of time increases the chance of developing a catheter-associated urinary tract infection (CAUTI). Catheter associated urinary tract infection (CAUTI) is common nosocomial infection throughout the world and it is nearly 30-40 percent of all hospital acquired (nosocomial) infections⁴. CAUTI can be asymptomatic bacteremia to symptomatic. Patients with comorbidity are at high risk to develop CAUTI and can lead to various complications such as prostatitis, cystitis, epididymo-orchitis, pyelonephritis, and various other complications such as meningitis, septic arthritis, infective endocarditis, endophthalmitis, vertebral osteomyelitis. Bacteremia develops in 3 percent of all catheterized patients. Extended hospital stay, and increased cost, morbidity and mortality are seen in patients with CAUTI who develop complication. As per Centre for Disease Control there is increased by 2.8 fold of mortality and morbidity due to CAUTI and 1-3 days hospital stay increase. Incidence of sterile urine converting to bacteriuria occurs at a rate of 3-10% per day. In most of the hospitals definitive indications for use of catheter have been identified and are in use.

To create preventive strategy for daily care of the patients, it is necessary to know the factors responsible for urinary tract infection.

AIM:

To study the clinical profile of catheter associated urinary tract infection (CAUTI) in adult population acquired during hospital stay.

OBJECTIVES:

- To find out Hospital incidence of catheter associated urinary tract infection during hospital stay
- To identify organisms isolated from urine analysis
- To find out final outcome of catheter associated urinary tract infection during hospital stay.

MATERIAL AND METHODS

The study was carried out in the Medicine Department of Bharati Vidyapeeth (Deemed to be University) Medical College and Hospital Sangli, for period of 18 months after obtaining Institutional Ethical Committee Clearance.

Study design:

Cross sectional observational study

Study Place:

Medicine intensive care unit and ward at Bharati Vidyapeeth (Deemed to be university) Medical college and hospital Sangli

Study population:

Patients admitted in Medical ICU and ward.

Study subjects:

Patients admitted and catheterized in Medical intensive care unit and ward

Sample size:

All consenting patient fulfilling inclusion and exclusion criteria were included in the study.

Inclusion Criteria:

1. All the adult patients admitted in ICU / ward who developed Catheter associated urinary tract infection after 48 hours of admission.
2. All cases who were catheterized for more than 2 days subjected to catheter removal and developed UTI on next day.

Exclusion Criteria:

1. Patients below 18 years of age
2. All patients admitted in hospital with urinary tract infection diagnosed on admission itself or referred from other hospital
3. Non catheter associated urinary tract infections.

- Patients who have had following procedures like suprapubic catheter, nephrostomy tube, urostomy, Ileal conduit.
- Patient now willing to participate in study.

Ethical Consideration And Permission:

The study proposal was approved by the Institutional Ethical Committee, as stated in a letter from the chairman, institutional ethical Committee (IEC) reference no (2019-20/328). While conducting this study, all the guidelines and instructions of the ethical committee were diligently carried out. Requisite permissions were taken from the IEC for the use of their intellectual materials, screening tools. Written authorization was acquired from the Head of the institute for conducting this study. Written informed consent was taken from each patient included in this study. Patient anonymity was maintained.

Study tools:

Proforma and report of patients with catheter associated urinary tract infection.

Study procedure:

This study was conducted in medicine intensive care unit and wards over period of 18 months at Bharati Vidyapeeth (deemed to be university) and hospital sangli. Written and informed consent was taken from all the patients. Total 120 patients were included in this study over period of 18 months. All the adult patients admitted in ICU / ward, who developed Catheter associated urinary tract infection after 48 hours of admission were included in study. Sample size that was achieved was 120 in consultation with microbiology department. Our aim of study was to find out occurrence of CAUTI in these patients. Data was collected from the patients included in the study using a preformed structured questionnaire. Details such as age, sex, clinical data like presenting complaints, personal history, past medical history, high risk factors like uncontrolled diabetes mellitus, neurological impairment (neurogenic bladder), immune-compromised status, physical examination findings And details of clinical diagnosis were collected.

Indication for catheterization was noted. Daily examination of the patients were done to look for any evidence of urinary tract infection such as fever, supra pubic tenderness and costo vertebral angle tenderness, abdominal pain, burning micturition, urgency, frequency.

Catheter care in the form of daily meatal care by betadine or soap water and maintenance of closed drainage were frequently monitored. The patients were followed till they developed bacteriuria or discharged, expired or catheter was removed. Day of development of symptom noted. The date of catheter removal and duration of catheterization was noted. Patients who were shifted to different ward were followed for up to 48 hrs for the developments of symptoms. Patient who develop CAUTI were put on antibiotics according to culture and sensitivity report, taking into account patients hematological, liver, renal profile. Minimum antibiotic days were 5 days. At the end of 1 week urine examination was done. Observation during this period were recorded and preserved for analysis and statistics at end of study period.

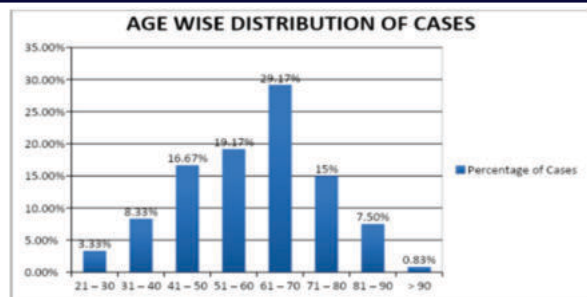
Statistical Analysis:

The Statistical analysis was performed by SPSS 22.0 version. Continuous variables were described as mean and variation of each observation from the mean value (Standard deviation) represented as mean $\pm$ SD (analyzed using unpaired T test). Categorical variables were described by taking percentages and analyzed using Chi square test. P value < 0.05 was considered significant

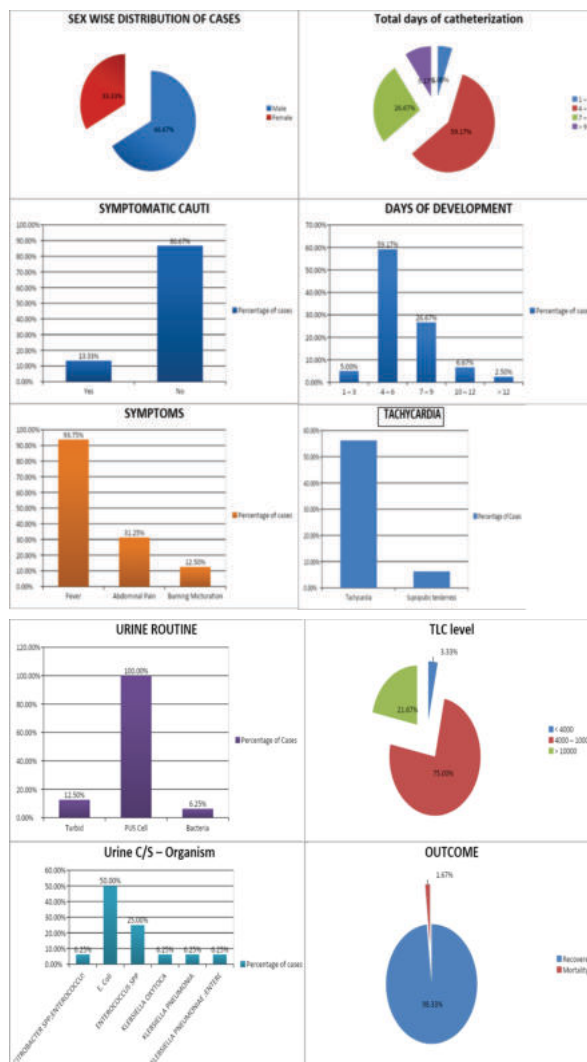
OBSERVATIONS AND RESULTS

Table 1: Age wise distribution of all cases

Age (in years)	No of Cases	Percentage (%)
21 – 30	4	3.33
31 – 40	10	8.33
41 – 50	20	16.67
51 – 60	23	19.17
61 – 70	35	29.17
71 – 80	18	15.00
81 – 90	9	7.50
> 90	1	0.83
Total	120	100



In present study most cases i.e. 29.17% cases were seen in 61-70 years of age group followed by 19.17% cases in 51 – 60 years of age group, 16.67% cases in 41-50 years of age group, 15% cases in 71-80 years of age group, 8.33% cases in 31 – 40 years of age group, 3.33% cases in 21 – 30 years of age group and one case i.e. 0.83% case had age more than 90 years of age.



SUMMARY AND CONCLUSION

- > Catheter associated urinary tract infections (CAUTI) are major concern as one of the nosocomial infections. This study emphasizes the seriousness of CAUTI. CAUTI rate was 21.41 per 1000 catheter days with total overall incidence of CAUTI was 13.33% predominantly affecting male gender.
- > Association was seen between age group and catheterization ($P < 0.0001$) i.e linear relation was established with ascending age and CAUTI.
- > In present study association was seen between TLC and catheterization $p = 0.0014$
- > Association was seen between outcome and Catheter associated urinary tract infection (CAUTI)

- CAUTI was associated with advanced age, diabetes mellitus, renal failure, catheterization, prior antibiotics, and steroid use. To reduce CAUTI and associated healthcare expenses, evidence-based protocol-based solutions are offered. Future research should look into whether specific diagnostic or therapeutic measures can help to lower the occurrence of CAUTI. Catheterization should be limited when possible, and the catheter should be removed as early as possible.

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