Original Article

TO OBSERVE THE INCIDENCE AND PREVENTION OF CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI) IN SHORT AND LONG-TERM PATIENT CARE AT A TERTIARY CARE HOSPITAL IN GHAZIABAD

Dr.Priyanka Jadaun, Dr.Shalabh Gupta, Dr.Tripta S.Bhagat, Dr. Saikh Kasif Sahajada

Dr. Priyanka Jadaun, JR 3,Department of General Surgery, Santosh Medical College and Hospital. Ghaziabad, U.P. India.
Dr. Shalabh Gupta, Professor and Head, Department of General Surgery, Santosh Medical College and Hospital. Ghaziabad, U.P. India.
Dr. Tripta S.Bhagat, Professor, Department of General Surgery, Santosh Medical College and Hospital. Ghaziabad, U.P. India.
Dr. Saikh Kasif Sahajada, Senior Resident, Department of General Surgery, Santosh Medical College and Hospital. Ghaziabad, U.P. India.
Corresponding Author: Dr Shalabh Gupta 14/22, Raj Nagar, Ghaziabad, Uttar Pradesh 201002.
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Abstract

Objectives: Urinary catheterization is a very common procedure in various types of patients but associated with short term as well as long term complications which may beat times very fatal such as Catheter associated urinary tract infection (CAUTI). It can be prevented easily by observing strict asepsis during catheterisation and educating the health care workers and patients regarding catheter hygiene.

Methods: This is a type of observational study which was conducted in the Department of General Surgery, Santosh Medical College and Hospital Ghaziabad, UP during a period from January 2020 to December2021. We have included the patients admitted in our ICU and wards of departments of Surgery, Medicine, Orthopaedics and Gynaecology.

Results: Catheter induced UTI was common in patients who were old and immunocompromised, those where there was accidental breach of sterility during catheterization, material of catheter (latex>silicon), less in patients undergone elective surgery as catheterization done under strict aseptic conditions in the OT.

Conclusion: Foleys Catheterization use and time for removal should be minimized in patients, especially those at increased chances for catheter-associated UTI (eg, women, elderly persons, and patients with impaired immunity. Catheters should be kept in place only as long as needed.

Keywords: catheter associated urinary tract infections, foley's catheter, condom catheter, gram negative bacteria

INTRODUCTION:

Infections related to medical care are infections acquired during the course of receiving treatment for other conditions at hospital or in a medical centre. It has long been acknowledged that CAUTI (Catheter Associated Urinary Tract Infections) is the most common infection in Health care settings. More than 35% of Health Care Infections is attributed to urinary tract infections. Urinary catheterization is defined as an intervention to enable emptying of the bladder by insertion of a catheter. Indwelling urinary catheterization is categorized as either short-term (in situ less than 28 days), or long-term (in situ greater than 28 days). It is a well-established fact that longer we keep the catheter in situ, more are the chances of developing CAUTI [1]. It's a result of the widespread use of

catheterization and much of which is inappropriate in hospitals and long term care facilities. It has been estimated that the risk of acquiring an infection increases by 5% each day the catheter remains in situ. An average of 25% of hospitalized patients are catheterized at some stage during their admission, therefore, it is critical that practices and procedures are in place to minimize the risk of infection and [2,3].

A UTI where an indwelling urinary catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1 is known as Catheter associated urinary tract infection.

Presence of any 1 of the following eg. Temperature more than 38°C, urgency, hypochondrium tenderness, increased frequency, Costovertebral angle pain or tenderness, Dysuria With no other recognized cause is diagnosed as CAUTI. Laboratory Evidence - At least 1 of the following POSITIVE findings: Dipstick for leukocyte esterase and/or nitrite, Pyuria (urine specimen with 10 WBC/mm3 of unspun urine or >5 WBC/high power field of spun urine)/microorganisms seen on Gram's stain of unspun urine. In terms of CFU $\geq 10^5$ CFU/ml and with no more than 2 species of microorganisms is known as UTI (Urinary Tract Infections) and A positive urine culture of $\geq 10^3$ and$<10^5$ CFU/ml and with no more than 2 species of microorganisms is known as SUTI (Symptomatic Urinary Tract Infection)

As per IDSA 2009 guidelines, if any catheter has been in place for more than 2 weeks at the onset of catheter-associated UTI and remains indicated, the catheter should be replaced to promote continued resolution of symptoms and to reduce the risk of subsequent catheter-associated infection [4]. The most important measure to prevent CAUTI is to limit the use of urinary catheters to carefully selected patients and try to remove as indication ends [5,6]. Before catheterisation, consider alternative management methods (e.g., condom catheter)[7]. Urinary catheters should not be used solely for the convenience of patient care or as a method of obtaining urine samples for diagnostic tests.

The longer the catheter remains in situ, the higher the risk of infection· Continuing catheterization should be reviewed daily and removed as soon as possible. There is no role for routine antimicrobial prophylaxis in patients with urinary catheters.

DESIGN AND METHODOLOGY :

This type of observational study which was conducted in department of general surgery, Santosh Medical College and Hospital Ghaziabad, UP during a period from June 2020 to December 2021. We have included 75 patients admitted in ICU, Surgery, Medicine and Gynaecology Departments. A check list was provided to all and filled at the time of insertion of catheter and data was analyzed after getting proper consent from patients and attendants.

Inclusion criteria:

1. All the patients admitted under Casualty , ICU , Surgery , Medicine or Gynae ward requiring catheterization either short term or long term
2. Age > 18 years
3. Both genders

Exclusion Criteria: Known case of UTI, Recurrent UTI, Associated Congenital anomaly of urinary tract ,Patients having Systemic Fungal Infection, Previous Perineal infection ,Patient`s refusal for study

OBSERVATION AND RESULTS

1. AGE DISTRIBUTION

18-40 yrs	27(36%)
41-60yrs	39(52%)
>60yrs	09(12%)

2. GENDER

Males	47(62.6%)
Females	28(37.3%)

3. REASON OF CATHETERIZATION

Intra-op monitoring of urine output	44(58.6%)
Others (to measure i/o, urinary retention, pelvic bone#, bedridden, chronic infections)	31(41.3%)

4. PRESENTATION

Asymptomatic	07
Symptoms	05

5. SYMPTOMS

Symptoms	No.of patients
Fever	1
Burning micturation	1
Pain lower abdomen	1
Increased frequency of micturation	4

6. PLACE OF CATHETERIZATION

In O.T.	44
Ward /emergency	12
Outside hospital	19

7. TYPES OF CATHETER

Latex	72(96%)
Silicon	03(4%)

8. CATHETER INDUCED COMPLICATIONS

Yes	00
No	75(100%)

9. CULTURE AND SENSITIVITY RESULTS

No growth observed	63(84%)
CAUTI(growth +)	12(16%)

10. TYPES OF CATHETER INVOLVED IN CAUTI

Latex	11(91%)
Silicon	01(8%)

11.CAUTI AS PER PLACE OF CATHERIZATION

O.T.	01(8%)
Ward/emergency	07(58%)
Outside hospital	04(33%)

12. ISOLATED MICRO-ORGANISMS

Klebsiella species	02(16.6%)
Escherichia coli	06(50%)
Pseudomonas aurginosa	02(16.6%)
Citrobacter species	01(8.3%)
Staphylococcus aureus	01(8.3%)

13. ANTIBIOTICS SENSITIVITY

Antibiotics	Number of patients
Nitrofurantoin	3
Flouroquinolones	4
Amikacin	2
Tetracycline	1
Pipracillin+tazobactum	1
Chloramphenicol	1

14. OUTCOME WITH TREATMENT

Improved	08(In 5days of antibiotics) (66%)
Relapsing	00
Recurrent uti	04(followed up for 14days)(33%)

15. PATIENTS OF RECURRENT UTI AS PER THE PLACES OF CATHETERIZATION

O.T.	00
Ward	04
Outside hospital	00

16. ORGANISMS ISOLATED IN RECURRENT UTI

Escherechia coli	01
Pseudomonas arguinosa	03

17. ANTIBIOTICS SENSITIVITY OF RECURRENT UTI

Nitrofurantoin	04

DISCUSSION:

The rate of catheter associated infections shows variation in India. According to a study conducted by Priya Datta et al (2014) found the CAUTI rate as 10.75% and 9% by Pooja et al (2014) [8,9]. A survey conducted to determine the DAIs in the ICUs of 8 different developing countries reported that CAUTI comprised 29% of all DAIs. Due to these wide variations in the incidence, it is important for a hospital to generate its own data for the implementation on proper infection control programmes.

Total 75 patients were included in the study, out of which 12 developed infection resulting in incidence of 16%. Out of which 27(36%) patients belongs to age group 18-38 yrs , 39(39%) patients belongs to 39-59 yrs, only

09(12%) patients belongs to age group >60yrs as illustrated in table no 1. Out of 75 patients, 47 (62.6%) were males and 28(37.3%) females illustrated in table no 2.

Catheterization was done in 44 (58.6%) patients after operation under General or Spinal Anaesthesia as they were not able to pass urine in post operative period out of which only 1 patient developed CAUTI as illustrated in table 3. Rest 31 (41.3%) patients were catheterized due to other causes like urinary retention, pelvic bone or long bone fracture, bedridden patient, patient on ventilator, to measure urine input and output as routine treatment protocol, out of which 11patients developed CAUTI. Latex catheter was used in 72 (72%) patients and silicon catheter used in 3 (4%) patients only as 2 patient were having pelvic bone fracture, 1 was having urethral rupture. 12 (16%) patients were diagnosed with Catheter associated Urinary Tract Infection in which Klebsiella species was isolated in 2(16.6%) patients, 06(50%) patients with Escherechia coli, 2(16.6%) patients with Pseudomonas aurginosa, 1(8.3%) patient had Citrobactor species, 1(8.3%) patient with Staphylococcus aureus species. In this study, the predominant isolates were Gram negative bacilli comprising 83% of the isolates.This finding was similar to other studies where in gram negative bacteria constituted the common isolate as in studies conducted by Neha Garg et al (80%) , Priya Datta et al (72.61%) and C.M.Poudel et al (66.67%) [8,10,11]. A prospective study conducted by Tullu MS et al (1998) found the commonest organism was Escherichia coli which was similar to our study in which incidence of E.coli was 50%.[12]

They were prescribed with the most sensitive antibiotics as per culture and sensitivity report and followed accordingly. In 63 (84%) patients however no growth was observed in culture and sensitivity.

CONCLUSION

This study was conducted at Santosh Medical College and Hospital aimed at detecting one of the most common healthcare associated infection i.e. Catheter associated urinary tract infection. The incidence of Catheter Associated Urinary Tract Infection was found to be 16%, in 50% of patients E.coli was isolated organism, Latex material catheter was used in 91% of the affected patients and 33% patients had recurrent CAUTI.

As we see the incidence of CAUTI is playing a major role in various other ailments and it significantly alters the outcome of the treatment. It became very essential to take all possible measures to reduce the chances of its occurrence. And hence it is of utmost importance to educate all the healthcare workers regarding proper procedural asepsis and proper catheter care. The patient, the relatives and other caretakers should also be educated regarding proper catheter care. The indwelling catheter should be used in the patients only if there is a valid indication. It should be removed when it is no longer indicated. If the catheter is required for more than 21 days, it should be replaced or alternative methods of catheterisation such as condom catheter should be considered .

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