



PREVALENCE OF CATHETER ASSOCIATED URINARY TRACT INFECTION IN INTENSIVE CARE UNIT PATIENTS AFTER NON-UROLOGICAL PROCEDURES- A SINGLE CENTRE STUDY

Urology

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ABSTRACT

The increased morbidity and mortality associated with nosocomial infections in the ICU is a matter of serious concern today. Here we are investigating the incidence of CAUTI in ICU patients admitted after non-urological procedures. In this study total of 100 patients with Foleys rubber urinary catheter were included. The urine samples were collected in a sterile container and taken for further studies. Our results showed that there is no significant difference in the chance of CAUTI in male and female patients. *P. aeruginosa* (40.90%) was the major pathogen causing infection in immunocompromised patients followed by *E. coli* (38.63%), *Klebsiella* sp (13.63%) and *Enterococcus* sp (6.81%). Understanding the incidence of infection is important in the management patients. The present study will help in understanding the prevalence of bacteria associated infection in ICU patients that will help in identification and early treatment of CAUTI.

KEYWORDS:

CAUTI, ICU, UTI, catheter

Introduction

Urinary tract infections (UTIs) are the most common bacterial infections acquired from community and hospital systems^{1,2}. UTI may present at all ages of men and women. The major uropathogens include *Pseudomonas aeruginosa*, *Escherichia coli*, *Candida* sp., *Proteus mirabilis*, *Staphylococcus* and *Klebsiella* sp³. In most cases, if the infection is not treated properly, infection multiplies and spreads to the ureter causing kidney infection leading to health complications⁴.

The increased morbidity and mortality associated with nosocomial infections in the intensive care unit (ICU) is a matter of serious concern today⁵. It has been reported that the incidence of nosocomial infections in the intensive care unit (ICU) is about 2 to 5 times higher than in the general in-patient hospital population⁶. Catheter-associated urinary tract infection (CAUTI) is a common device-associated infection in the United States and one of the most common health care-associated infections worldwide. Here we report the incidence of CAUTI in ICU patients admitted with non-urological surgery.

Materials and methods

This study was conducted in the patients of ICU with Foleys catheter after non-urological procedures admitted in Yenepoya Medical College Hospital between February 2016 and March 2017. The age, gender, dates of surgery, duration of ICU stay of selected patients were recorded properly. Only Foleys rubber catheters were used, and careful attention was given to the drainage system. The urethral catheters were inserted after wearing sterile gloves and using sterile drapes to avoid risk of infection. Urine was collected directly from catheter after 4 days of catheterisation with a sterile syringe in a sterile container. The urine was taken to microbiology laboratory for isolation and identification of bacteria.

The urine was serially diluted and cultured on Nutrient agar, Muller Hinton agar, Cetrimide agar and MacConkey agar plates and incubated at 37°C for 24 hours.

Results

A total of 100 patients with Foleys rubber catheter whose urine was sterile before the catheterisation were included in this study. After 4 days of catheterization 88% patients showed CAUTI, in that 52% were males and 48% were females (Fig 1). The age distributions of the patients included in the study were comparable, 56.5 ±16.26 and 56±19.79 years respectively in male and female group (Table 1). The results indicating that the chance of CAUTI is similar in male and female in ICU patients.

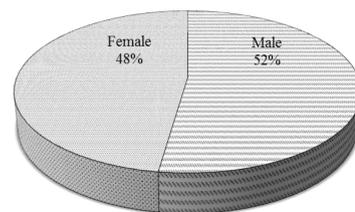


Fig.1. Distribution CAUTI in male and female of ICU patients

Microbiological study showed that, *P. aeruginosa* (40.90%) was the major pathogen in ICU followed by *E. coli* (38.63%), *Klebsiella* sp (13.63%) and *Enterococcus* sp (6.81%). In males *P. aeruginosa* was the predominant uropathogen (50%) but in female it was *E. coli* (45.23%). There were no history of UTI in past six month in any of selected participants and no one was diabetic (Fig 2).

Table 1: Patient demographics

CAUTI in ICU patients		
	Male	Female
Participants (n)	46	42
Mean age (y)	56.5 ±16.26	56±19.79
Previous history of UTIs	Nil	Nil
Diabetic	Nil	Nil

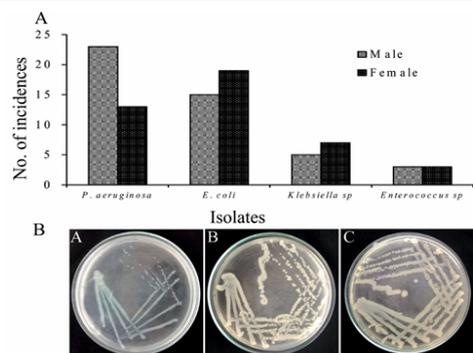


Fig.2. A) Figure showing the number of uropathogens associated with CAUTI in ICU patients, B) Representative images of uropathogens isolated from catheter, A) *P. aeruginosa*, B) *E. coli* and C) *Klebsiella* on Muller Hinton agar plate.

Discussion

The present study was conducted in surgical ICU at Yenepoya medical college hospital; a 950 bedded medical college hospital. Catheter associated UTI is a serious cause of morbidity and mortality in ICU patients. This study revealed that there is high risk of CAUTI in ICU patients. There was no significant difference in CAUTI observed among male and female patients. *P. aeruginosa* was the major pathogen followed by *E. coli*, *Klebsiella* sp, and *Enterococcus* sp. Similar to our findings, Datta et al., (2014) also reported that *P. aeruginosa* is the major cause of infection in ICUs⁷. It is observed that hospital acquired UTIs account for about 35-45% of the nosocomial infections⁸ and about 80% of these are related to the use of urethral catheter⁹.

In the present study there was no significant difference among gender in developing bacterial infection in intensive care patients. This finding is supported by previous studies by Agarwal *et al.*, (2006)¹⁰. The longer use of catheter may increase the chance of infection in immunocompromised patients. Decreasing catheterised duration and patient days on intervention are important for reducing the incidences of infection. Health care associated infections are 5-10 times more frequently observed in ICUs, despite low percentage of the patients being treated in ICU¹¹.

Conclusion

UTIs are the second most common infections in both hospitalized and community patients at all ages. The increasing reports on UTI in ICU patients have become a major concern in the public health area given that the lack of effective treatment options for these infections. By this study we can understand the prevalence of bacteria associated with urinary tract infection that will help in identification and early treatment CAUTI.

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