



## RESEARCH ARTICLE

## Study of the prescription patterns of medication for urinary tract infection in patients admitted to ICU in a tertiary care hospital

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### Abstract

In order to study the prescription pattern of medications for urinary tract infections and to evaluate the overall incidence of UTI in ICU Ward of a tertiary care hospital we conducted prospective observational studies among 100 patients through case report form (CRF) for a period of 6 months. The methodology includes collection of the data of patients through CRF and the data collected will be imported to Microsoft excel sheet and various objectives will be verified using the data on the excel sheet. Our observation on the medication pattern in the UTI patients in ICU Ward of tertiary care Hospital indicated that the common antibiotics used are ciprofloxacin (12%), norfloxacin (78%), ofloxacin (10%). The rate of incidence of UTI was about only 4% since the incidences were <5%. Our observations suggest that the hygienicity of the ICU Ward was well maintained, 7% of patients were having complications such as suppressed immune system, Diabetes, kidney infection, kidney failure, blood poisoning. Out of 100 patients, 6 were found to be male patients and 94 were female patients, rate of UTI in case of pediatrics it was 7% for geriatrics it was 35% and for adults it was 58%. The observations indicated that 7% of UTI female patients were pre-menopause stage, 62% were in menopause and 51% were in post-menopause. The present study indicated that the prevalence of UTI is common in female patients. In Hospital setting Urinary catheterization increases the risk for urinary tract infections. Flouroquinolones such as norfloxacin is widely used to treat UTI. Though the rate of occurrence of UTIs in ICU Ward is low but efforts should be made to further reduce it.

**Keywords:** UTI, ICU, antibiotic, CRF

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### Introduction

Urinary tract infection is one of the most common bacterial infections (Foxman, 2002). Life time risk of developing an UTI is as high as 1 in 5 in women. The risk in men increases with age and age related diseases like diabetes mellitus and benign prostate hypertrophy. In long term care facilities and in hospitalized patients, UTI is second most common nosocomial infection (LizaGenao et al., 2012). In hospitalized patients the risk of UTI increases with increase in duration of stay as well as with utilization of catheters (Foxman, 2002).

Malnutrition, poor hygiene and low socioeconomic groups are associated with higher rates of UTI suggesting higher rate of infection in rural settings (August and De Rosa, 2012). The current study is undertaken to evaluate the incidence of UTI in a tertiary care hospital. The data obtained from this study will provide information on rate of admission to the hospital due to primary or secondary UTI. Additionally nosocomial UTI rate will be evaluated.

Treatment approaches for UTI depend on various factors. Some of the patient factors which impact the

choice of antibiotic used include age, gender, allergy status and presence of secondary complications or risk factors. In many hospitals the choice of antibiotic used depends upon the formulary. The antimicrobial agents most commonly used to treat uncomplicated urinary tract infections include the combination drug trimethoprim and sulfamethoxazole, trimethoprim,  $\beta$ -lactams, fluoroquinolones, nitrofurantoin, and fosfomycin tromethamine (Neu, 1992). Fluoroquinolones are most commonly prescribe antibiotics since are effective against both *Escherichia coli* and *Staphylococcus saprophyticus* microorganisms. The current study will evaluate the antibiotics used in the treatment of UTI. To study the prescription pattern of medications for urinary tract infections in patients admitted to ICU of a tertiary care hospital. To evaluate the overall incidence of UTI in the ICU Ward of a tertiary care hospital. Antibiotic utilization pattern for the treatment of UTI in a tertiary care hospital.

**Materials and Methods**

Study period: 6 months

Study design: Prospective observational studies

Sample size: 100 (both male and female of ICU department in a tertiary care hospital)

Methods for collecting data: Through CRF (Case Report Form)

Data management: Data will be entered and managed in excel sheet

Statistical analysis: Descriptive statistics

The research work was planned for a period of 6 months and the design of research work is completely prospective observational studies which will include a sample size of 100 patients. The methodology includes collection of the data of patients through case report form

and the data collected will be imported to Microsoft excel sheet and various objectives (as mentioned below) will be verified using the data on the excel sheet.

Usage of Medication pattern for UTI patients admitted in the ICU, The incidences of UTI in ICU Ward will be evaluated and will be expressed in percentage, the specificity to age will be studied, variation of gender rate will be calculated, occurrence of UTI in women according to menopause stages, usage of antibiotics and rate of secondary complication along with UTI will be evaluated.

**Results**

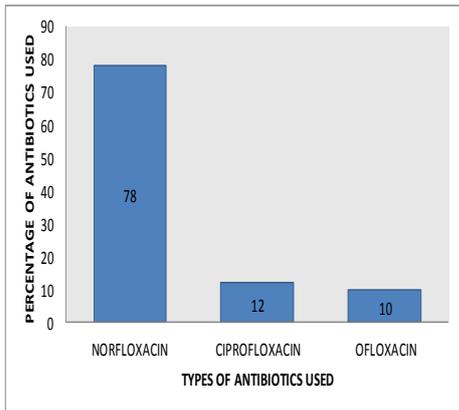
**Table 1.** The medication pattern in UTI patients

Medications	Generic name
Ciproflox	Ciprofloxacin
Norflox	Norfloxacin
Oflin	Ofloxacin
Dolo	Paracetamol
Pantocid	Pantoprazole
Citralka	Disodium hydrogen citrate

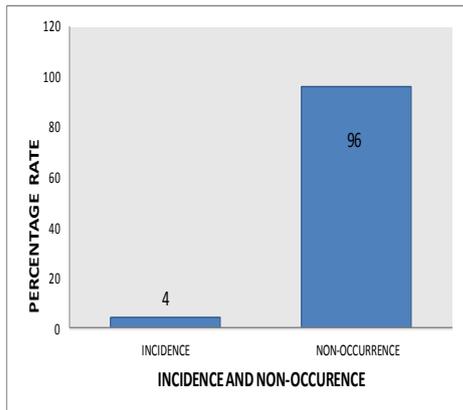
Our observation on the medication pattern in the UTI patients in ICU Ward of tertiary care Hospital indicated that the common antibiotics used are ciprofloxacin, norfloxacin, ofloxacin. Along with antibiotics some other medications are also given to treat the sign and symptoms of UTI and it includes paracetamol, pantoprazole, di-sodium hydrogen citrate. The datas collected to find the prescription pattern of antibiotics in UTI patients indicated that the common antibiotics used in the UTI infection in the tertiary care hospital in Hoskote, Bangluru Karnataka was found to be the Fluoroquinolones derivatives such as ciprofloxacin, norfloxacin and ofloxacin. A graph was drawn for

studying the percentage usage of different antibiotics used in UTI, in which different types of antibiotics are compared against percentage usage. The antibiotics using for UTI can be represented in percentage as below: Norfloxacin-78%, Ciprofloxacin-12%, Ofloxacin-10%

**Fig. 1.** The percentage of antibiotics used in UTI patients



**Fig. 2.** The percentage of incidence and non occurrence in ICU ward



**Fig. 3.** Rate of secondary complications

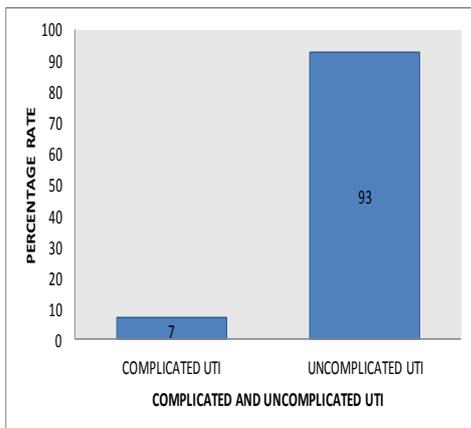
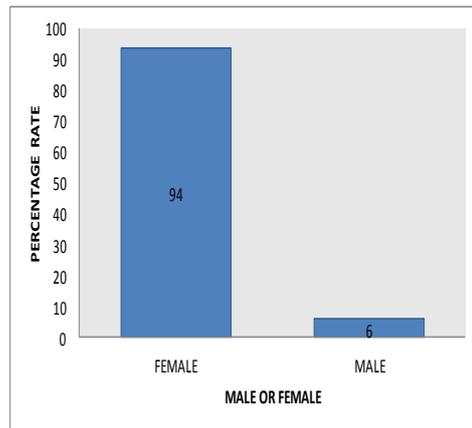


Figure 2 represented the rate of incidence and non-occurrence of UTI in ICU ward of the tertiary care Hospital in Hoskote, Bangalore. A graph was drawn based on the data with incidence and non-occurrence against percentage rate and the data obtained was as follows: The rate of incidence of UTI was about only 4% while non-occurrence rate was 96%. The data collected to find the rate of secondary complication in UTI patients, indicated that 7% of patients were having complications such as suppressed immune system, Diabetes, kidney infection, kidney failure, blood poisoning etc while 93% were found to have no complications.

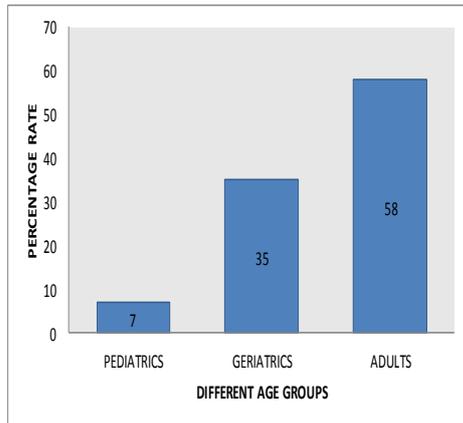
**Fig. 4.** Variation according to gender



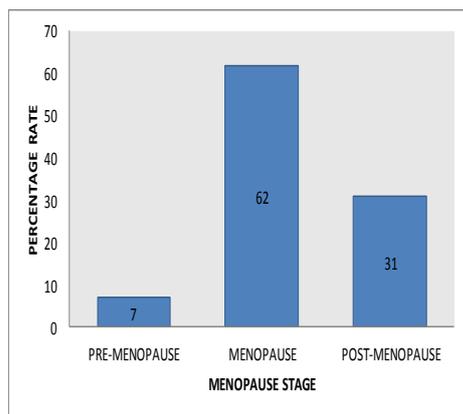
The gender-based occurrence of UTI was calculated .out of 100 patients 6 were found to be male patients and 94 were female patients therefore their percentage rate was observed to be 6% and 94% respectively (Fig. 4). The variation of rate of UTI in different age group was collected from the data and a graph was plotted with different age groups against percentage rate. The results obtained were as follows, in case of pediatrics it was 7%, for geriatrics it was 35% and for adults it was 58% (Fig. 5). The Fig. 6 indicated

the stage of menopause in female patients. The data was calculated since the incidence of UTI was found to be more in women. The observations indicated that 7% of UTI female patients were pre-menopause stage, 62% were in menopause and 51% were in post-menopause.

**Fig. 5.** Percentage of uti patients based on age



**Fig. 6.** Occurrence of uti according to menopause stages



**Discussion**

Urinary tract infection (UTI) can be defined as an infection that occurs to the various parts of urinary tract. Our observations to find the prescription and prevalence of UTI indicated that flouroquinolones was most commonly prescribed antibiotics and adult females were most affected with UTIs. The data indicated that norfloxacin, ciprofloxacin and ofloxacin are frequently prescribed in UTIs (Fig. 1). UTIs are caused by *Escherichia coli* or *Staphylococcus saprophyticus* microorganisms. Flouroquinolones were reported to be

effective against both *Escherichia coli* and *Staphylococcus saprophyticus* microorganisms. Advantages of using flouroquinolones over other antibiotics in UTIs are broad-spectrum bactericidal activity, excellent oral bioavailability, good tissue penetration and favorable safety and tolerability profiles. Pantoprazole sometimes used to reduce the amount of acid the stomach produces by blocking the action of an enzyme (proton pump) that produces acid in the stomach.

Fig. 2 indicated the rate of incidences of UTIs in ICU patients. The observations indicated that 4% of patients were affected with UTIs. The causes for UTIs could be due to using of indwelling urinary catheters, patients undergoing urological manipulations, long-stay elderly male patients and patients with debilitating diseases. The organisms responsible usually originate from patients' endogenous intestinal flora, but occasionally from a moist site in the hospital environment, since the incidences were <5% our observations suggest that the hygienicity of the ICU Ward was well maintained. The rate on secondary complications in UTI patients suggests that 7% of patients had complications such as Suppressed immune system, Diabetes, kidney infection, kidney failure, blood poisoning. Fig. 3 indicated relationship between these complications and UTIs. Our observations on the gender-wise distributions of UTIs in ICU Ward indicate that 94% of affected patients were females (Fig. 4). Up to one-third of all women will experience a UTI at some point during their lifetimes (Valiquette, 2001). Women are more prone to UTIs than men because, Women have a shorter urethra than men do, which cuts down on the distance that bacteria must travel to reach a woman's bladder. Adult patients (58%) were mostly affected with

**Table 2.** The points for proper hygenicity of hospital

Conseling points
If you are concerned about cleanliness in the hospital or if you spot any dirt or dust, Please inform a member of staff
Place your rubbish in the bins provided,green bins are available for recyclable waste
Keep space around you and your bed tidy and uncluttered so that cleaning staff can Access all the surfaces easily
Do not store any belonging on the floor, use locker and wardrobe provided-some Belongings must be sent home if there is not enough space available to store them
Always remove your toiletries and clothes from bathroom after use
Do not place any clothes on the radiators
Refrain from littering public areas, corridors and the paths outside the hospital
Not touching your wounds or your dressing or any of your devices,forexample drips or catheters
Cleaning your hands before you enter and leave the Ward or Department. Encouraging your visitors/relatives to wash their hands or use the alcohol hand gel Provided
Asking your visitors/relatives to use the public toilets ,as patient toilets are for Patients use only

UTIs compared to pediatrics and geriatrics (Fig. 5). The prevalence of UTIs as per the menopause stage was represented in Graph No 6. Females at Menopause were observed to be maximum affected with UTIs. As a woman's estrogen levels decrease with menopause, her risk of urinary tract infections increases due to the loss of protective vaginal flora (Dielubanza and Schaeffer, 2011). Additionally, vaginal atrophy that can sometimes occur after menopause is associated with recurrent urinary tract infections (Goldstein et al., 2013).

### Conclusion

The present study indicated that the prevalence of UTIs are common in female patients which could cause recurrences with nearly half of the patients will get a

second infection within one year and the frequency becomes more in menopausal stage. In Hospital setting Urinary catheterization increases the risk for urinary tract infections. Flouroquinolones such as norfloxacin is widely used to treat UTIs. Though the rate of occurrence of UTIs in ICU Ward is low but efforts should be made to further reduce it by performing catheterizing only when necessary, using aseptic technique for insertion, and maintaining unobstructed closed drainage of the catheter and also educating the patients and their care takers, about the need and necessities to maintain the hygenicity in the Hospital.

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