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Drug Utilization Pattern in Urinary tract infections: A Retrospective study

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ABSTRACT

Urinary tract infections (UTI) are a frequent problem in primary care; consequently most cases are considered uncomplicated UTI. Etiology is influenced by factors such as age, diabetes, spinal cord injury, urinary catheterization, and other factors. Escherichia coli cause 80-85% of acute episodes of uncomplicated cystitis. Staphylococcus saprophyticus, proteus mirabilis, streptococcus agalactiae and klebsiella species are responsible for most of the remaining episodes. The empirical treatment of UTI requires constant updating of the antibiotic sensitivity of the main uropathogens of the area, country or institution. The study was designed as a retrospective study in 300 patients of mild to moderate Urinary Tract Infection. The case record files were retrieved from the medical records department based on the ICD-10 disease coding. The demographic were recorded. Total admissions, first admission and readmissions were identified and medication status of all patients at admission and at discharge was ascertained. Comparison of various groups of drugs prescribed in 4 major groups (1-20 years, 21-40 years, 41-60 years, >60 years) of patients on admission and on discharge. A total of 300 patients were included in the study, out of which 147 were males and 153 were females. The mean duration of hospital stay was 4.3 days and with a minimum duration of two days hospitalization and maximum of 10 days hospitalization. 30 % admitted patients receive combination of two antibiotics (cephalosporin+ aminoglycoside) as a part of treatment and 17 % received a combination of 3 antibiotic(cephalosporin + aminoglycoside + penicillin) while, 53 % patient managed with mono therapy (cephalosporin). 60 % of patients received cephalosporin at discharge, 28% patients were asked to continue with aminoglycoside. The study shows that though use of cephalosporin as first line therapy recommendations may change, clinical practice may still be affected by factors other than the decision of ability to diagnose UTI. There is an increased use of cephalosporin as first line drugs, Irrespective of the causative agent for UTI, which is an unhealthy practice. The use of cephalosporin for all types of UTI is also on the increased. These results should inform education of health professionals and rational drug use policies to reduce poly-pharmacy.

Keywords: Cephalosporin, Aminoglycoside, Penicillin, Urinary Tract Infection

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INTRODUCTION

Urinary tract infections (UTI) are a frequent problem in primary care. They occur mainly in women without underlying diseases and with no functional or structural anomalies of the urinary tract; consequently most cases are considered uncomplicated UTI. Etiology is influenced by factors such as age, diabetes, spinal cord injury, urinary catheterization, and other factors. *Escherichia coli* cause 80-85% of acute episodes of uncomplicated cystitis. *Staphylococcus saprophyticus*, *Proteus mirabilis*, *Streptococcus agalactiae* and *Klebsiella* species [1] are responsible for most of the remaining episodes. The spectrum of bacteria that causes complicated UTI is much broader. Rates of resistance have undergone considerable variations, and consequently the empirical treatment of UTI requires constant updating of the antibiotic sensitivity of the main uropathogens of the area, country or institution. To correctly interpret the global data on sensitivity, the type of UTI (uncomplicated versus complicated), sex, age and previous antibiotic therapy in each patient must be taken into account. Resistance in uncomplicated UTI has clinical significance although less than in systemic infections such as bacteremia, which depends on whether the infection is cystitis or pyelonephritis [2].

The goals of the management of UTI are: (i) prompt diagnosis of concomitant bacteremia (ii) prevention of progressive renal disease by prompt eradication of the bacterial pathogen, identification of abnormalities of the urinary tract and prevention of recurrent infections; and (iii) resolution of the acute symptoms of the infection. Delay in initiation of the antibacterial therapy is associated with an increased risk of renal scarring. The initial choice of antibacterial therapy is based on the knowledge of the predominant pathogens in the patient's age group, antibacterial sensitivity patterns in the practice area, the clinical status of the patient and the opportunity for close follow-up. Patients with significant urinary tract abnormalities and/or frequent symptomatic UTI may benefit from prophylactic antibacterial. The main long term consequence of UTI is renal scarring which may lead to hypertension and end-stage renal disease. Prevention of recurrent UTI focuses on detection and correction if possible, of urinary tract abnormalities [3.] Urinary tract infections (UTI) usually are mono infections caused by the endogenous microflora including gram-negatives, such as *Escherichia coli*, or gram-positives, like enterococci. This allows for an empiric treatment of uncomplicated UTIs and a short duration of therapy to minimize the probability for the development of resistance. Resistance often is based upon mutations altering the drug target (sulfonamides, trimethoprim, fluoroquinolones, and fosfomycin) or acquisition of resistance genes (beta-lactam). The latter can be collocated with other resistance genes on mobile genetic elements mediating multiple drug resistance. Empiric treatment of uncomplicated UTIs is associated with a significantly increased duration of therapy suggesting alternative antibiotic regimens [4].

MATERIAL AND METHODS

The study was conducted in the Department of pharmacology, Kasturba medical college, Mangalore after getting approval from the institutional ethical committee. This is a retrospective case record study of all in patients admitted to Kasturba medical college hospital,

Mangalore with a diagnosis of UTI between January 2009 and June 2010. This study designed as a retrospective study in 300 male and female patients of mild to moderate Urinary Tract Infection. The case record files were retrieved from the medical records department based on the ICD-10 disease coding. The demographic were recorded. Total admissions, first admission and readmissions were identified and medication status of all patients at admission and at discharge was ascertained. Comparison of various groups of drugs prescribed in 4 major groups (1-20 years, 21-40 years, 41-60 years, >60 years) of patients on admission and on discharge. The patients were advised to get the used container of study medication during each visit to check for compliance. The adverse events reported or detected during examination were recorded with all the relevant details. All laboratory investigations were repeated again at the end of the study.

RESULTS

A total of 300 patients were included in the study. 51% were female patients whereas 49 % were male patient. The mean duration of hospital stay was 4.3 days and with a minimum duration of two days hospitalization and maximum of 10 days hospitalization.

Table 1: various group of drug prescribed in all four groups on admission

Drug group	1-20 years	21-40 years	41-60 years	>61 years
Penicillin	3.63%	3.63%	3.3%	4.5%
Aminoglycoside	4.03%	4.03%	3.69%	5.04%
Cephalosporin	16.15%	16.15%	14.10%	20.19%

Table 2: various groups of drugs prescribed in all four groups on discharge

Drug group	1-20 years	21-40 years	41-60 years	>61 years
Penicillin	4.27 %	4.27 %	3.91 %	5.34 %
Aminoglycoside	4.032 %	4.032 %	3.69 %	5.04 %
Cephalosporin	14.49 %	14.19 %	13.28 %	18.12 %

Table 3: Prescription of various group of drug based on gender on admission

Drug group	Male	Female
Penicillin	8.17 %	6.81%
Aminoglycoside	9.33%	7.46%
Cephalosporin	32.99%	34.33%

30 % admitted patients receive combination of two antibiotics (cephalosporin + aminoglycoside) as a part of treatment and 17 % received a combination of 3 antibiotic(cephalosporin + aminoglycoside + penicillin) while, 53 % patient managed with monotherapy (cephalosporin). 60 % of patients received cephalosporin at discharge, 28% patients were asked to continue with aminoglycoside. Proportionate use of each drug class with regard to age and gender will be ascertained in order to evaluate whether usage is differentially distributed across patient populations.



DISCUSSION

The objective of the study is to describe the drug utilization pattern in treatment of patients admitted to KMC Attavar with a diagnosis of UTI, to determine if the national drug policy guidelines on UTI are being followed and to determine any variation in drug prescription based on age and gender. This study was conducted with the aim of determining the current drug utilization pattern in four age group (1-20, 21-40, 41-60, >60 years) patients. Also, with the perceived safety of newer antibiotic drugs and increased knowledge of disease pathogenesis, there has been an increase in the prescription rates in the general. This increase in prescription also increases the likelihood of drug interactions and adverse effects. In our study of 300 UTI inpatients 24% were 1-20 years, 24% were 21-40 years , 22% were 41-60 years , 30% were >60 years patients with a larger percentage being females. The most common diagnosis was Urinary Tract Infection, while the most commonly prescribed drugs were Cephalosporin drugs. Several studies confirm the frequent prescription of Cephalosporin control Urinary Tract Infection. Studies have also shown that a large percentage of the elderly population receives aminoglycoside for an inappropriately long duration. The initial choice of antibacterial therapy is based on the knowledge of the predominant pathogens in the patient's age group, antibacterial sensitivity patterns in the practice area, the clinical status of the patient and the opportunity for close follow-up. The most commonly prescribed drug combination in our study was cephalosporin with aminoglycoside. This study is not intended to speak about the appropriateness of antibiotics medication decisions, which would require attention to specific drug class combinations and dosages assessed against any known practice guidelines for specific diagnoses. Rather, the purpose is to inform antibiotics prescribing practices in a tertiary care hospital situated in an endemic region with known incidence of resistance to anti-biotic drugs. The case record files will be retrieved from the medical records department based on the ICD-10 disease coding (World health organization, ICD-10, F00-F99). The demographic details will be recorded. Total admissions, first admissions, and readmissions will be identified, and the medication status (on or off medications) of all patients at admission and at discharge will be ascertained. Dose, frequency and duration of treatment with antibiotics used to treat the urinary tract infection will be recorded. Any adverse events to antibiotics if recorded in the case files also will be noted down. The relevant investigation, which includes microbiological and haematological investigations will be noted down.

CONCLUSION

This study shows that though first line therapy recommendations may change, clinical practice may still be affected by factors other than the decision or ability to diagnose Urinary Tract Infection. Urinary Tract Infection is endemic infection and there is emergence of Aminoglycoside resistant E.coli infection of urinary tract. There is an increased use of cephalosporin as first line drugs in Mangalore, irrespective of the causative agent for UTI, which is an unhealthy practice. The use of cephalosporin for all types of UTI on the increase and this practice must be curbed. This has implication for adherence to policy changes aiming to implement effective use of Cephalosporin. These results should inform education of health



professionals and rational drug use policies to reduce poly pharmacy. There is an increased use of cephalosporin as first line drugs, Irrespective of the causative agent for UTI, which is an unhealthy practice. The use of cephalosporin for all types of UTI is also on the increased. These results should inform education of health professionals and rational drug use policies to reduce poly-pharmacy. The initial choice of antibacterial therapy is based on the knowledge of the predominant pathogens in the patient's age group, antibacterial sensitivity patterns in the practice area, the clinical status of the patient and the opportunity for close follow-up. Patients with significant urinary tract abnormalities and/or frequent symptomatic UTI may benefit from prophylactic antibacterial. The main long term consequence of UTI is renal scarring which may lead to hypertension and end-stage renal disease. Prevention of recurrent UTI focuses on detection and correction if possible, of urinary tract infection.

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