ANALYSIS OF PRESCRIPTION PATTERN OF ANTIBIOTICS USED FOR THE MANAGEMENT OF URINARY TRACT INFECTION IN A KIDNEY CENTER

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ABSTRACT

Introduction: urinary tract infection (UTI) is noticeably most commonly known disease. It is define as presence of bacteria in urine which causes infection, so for such infection antimicrobials is the most commonly prescribed drugs but if it is prescribed in irrational way it may cause resistance to bacteria. The main objective of this study is to analyze the incidence, causative agent, types of antibiotic use, and the most common gender effected by UTI. Method: It is a prospective observational study conducted in a Kidney Institute on patients of UTI in period of approximately 4 to 6 months., we use a Proforma for the data collection. We collect information regarding the demography of the patients, causative agent of the UTI and the drugs utilized for the management of UTI. The information was collected from the patients files of the hospitalized patients. All the data was put into excel then coding was done and in last we analyze it through SPSS version 20. Result: Out of 110 patients 65(59.09%) were females and 45 (40.90%) were males. The age of the patient in the present study is under the range of 2months-95years. highest prevalence of UTI was found in the age group of between 61-70years 25(22.73%) followed by age group 51-60years 23(20.91%). Escherichia coli was found to be the most common organism. Culture sensitivity test was done only in 66% of the total cases. Most frequently prescribed antibiotics were B-Lactam (34) (39.09%), cephalosporin 25(28.7%) and quinolones (13) (14.9%). Conclusion: The results of this study may not be representative of the general population; but
UTIs are often treated empirically, and susceptibility tests are often carried out only when the patient has failed one or more courses of antibiotics. These data may be used to determine trends in antimicrobial susceptibilities, to formulate local antibiotic policies, to compare local with national data and overall to assist clinicians in the rational choice of antibiotic therapy to prevent misuse, or overuse of antibiotics.

**KEYWORDS:** Prescribing Trend, Antibiotic, Urinary Tract Infection and Culture Sensitivity Test.

**INTRODUCTION**

Urinary tract infections (UTIs) are considered as one of the most frequent bacterial infection in primary care and can be classified as either uncomplicated or complicated. Uncomplicated UTI appear in healthy individuals with no functional or structural abnormalities of the urinary tract.

The most common cause of existing symptoms are bacterial pathogens, and are treated mostly with antibiotics; that accounts for up to 95% prescription for UTI in primary care settings.[1] Urinary tract infection is thought to be the most frequent infection prevailing in patients of different age groups across the globe. It is a major reason of economic burden in society; the total cost with prescription antibiotics is 1.6 billion US $.[2] In majority cases, UTIs are uncomplicated cystitis that are caused by *Escherichia coli* in healthy individual. They can be easily managed with oral short-term antimicrobial therapy.[3]

Complicated UTIs are commonly associated with either functional or structural urinary tract abnormalities like calculi (stones), obstruction, immunosuppression, indwelling catheters or other drainage devices, renal transplantation, renal failure and pregnancy.[4]

A urinary tract infection (UTI) is a diseased condition in which one or more than one part of the urinary system become infected. Each kind of UTI can result in more specific symptoms that depends on that particular part infected. UTIs are the most common of all bacterial infections and can occur in the life of an individual at any time.[3] The most common UTIs mainly occur in women and affect the urethra and bladder.[5] UTI mainly involves the presence of bacteria in urine along with the signs and symptoms of infection. UTI although effect both the genders but are found as a major entity in females which may be either due to hormonal anatomical or other clinical differences. Number of factors may effect the
prevalence ratio of UTI in a population like diabetes, age, urinary catheterization etc.\cite{6} According to the study urinary tract infection has been diagnosed in 40% of the elderly inpatients (particularly more) which may be due to either lack of past history or non specific symptoms. Bacteria is among the common causative agent for UTI in humans and thus is caused by gram negative aerobic bacilli. Organisms causing infection include \textit{Escherichia coli} (80% to 85%) and \textit{Staphylococcus saprophyticus} (10% to 15%), while \textit{Klebsiella pneumonia}, \textit{Pseudomonas} and \textit{Proteus} species account for the rest.\cite{7} It is estimated that per annum there are 150 million UTIs, with symptoms occurring in as many as 7 million, from which 100, 000 needs hospitalizations.\cite{3,4} The incidence and prevalence of UTI is much greater in women than in men, at a ratio of 8:1, due to physiological and anatomical reasons. Poor hygiene, malnutrition and low socioeconomic status are associated with UTI.\cite{8}

Antibiotics significantly cover the management of UTI and broad spectrum antibiotics are mainly prescribed for this purpose. But for most their long range utilization has lead to the development of antibiotic resistance that had effect the cost of therapy and has resulted in many adverse reactions. Thus it is essential to be more focused towards the targeted approach while treating the infection to avoid such resistance and other consequences that might give infections a chance to re infect the individuals in future.\cite{7}

Monitoring of prescription can help in avoiding such problems and thus give feedback to the prescriber to make awareness of irrational prescribing of drugs. Properly defined prescribing pattern of drugs make it easy to target the infection more appropriately and reduces chances of drug resistance there by making the management more precise and specific.\cite{9} (Sunil S Gidamudi et al 2015).

The objective of this study is to assess the prevalence of prescribing pattern of common medications which are used in different age group of patients. Through this study we get to know the prescribing pattern of the medications commonly given to UTI infected patients and that help treat it, since if infection left untreated can lead to severe complications and unwanted consequences thereby affecting other organs of the body. Outcome of this study is anticipated to offer relevant information to the physicians and other healthcare personal to formulate the proper guidelines regarding prescribing antibiotics in UTI.
1. Purpose of Study
To evaluate the prescribing pattern of medicines in urinary tract infection patients in hospitalized tertiary care hospital.

4. RESEARCH METHODOLOGY
a. Setting: Our research is conducted in kidney institute on patients of urinary tract infection.
b. Target Population: This research is not gender or age specific it is conducted on all age group of patients from infants to adults.
c. Study Design: Study design of our research was observational study.
d. Duration of Study: The duration of our study was 6 months.
e. Sample Size: This study is conducted in 110 patients selected using convenient sampling technique.

Selection Criteria
Inclusive Criteria: The inclusive criteria for our study was patients diagnosed as UTI and admitted in hospital.

Exclusive Criteria: Exclusive criteria was patients with no UTI and outpatients were not included in the study.

Data Collection: we use a Performa for the data collection. We collect information regarding the demography of the patients, causative agent of the UTI and the drugs utilized for the management of UTI. The information was collected from the patients files of the hospitalized patients.

Data Analysis
All the data was put into excel then coding was done and in last we analyze it through SPSS version 20.

RESULT
Table No.1.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>65</td>
<td>59.09</td>
</tr>
<tr>
<td>Males</td>
<td>45</td>
<td>40.90</td>
</tr>
</tbody>
</table>

Table 1 shows that total number of patients included in the study were of 110 patients, which consist of 65(59.09%) were female and 45(40.90%) were male.
Table 2 shows the age wise category of patients in which mostly frequent age category patients were 61-70 years (25)(22.73%). whereas the least frequent age category of patients were 2-12 months (1)(.91%).

Table No. 4.
Disease Table

<table>
<thead>
<tr>
<th>UTI types</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystitis</td>
<td>26</td>
<td>23.64</td>
</tr>
<tr>
<td>pyelonephritis</td>
<td>84</td>
<td>76.36</td>
</tr>
<tr>
<td>Total</td>
<td>110</td>
<td>100</td>
</tr>
</tbody>
</table>

Above table shows that, 26(23.64%) were of cystitis disease patients and 84(76.36%) were of pyelonephritis disease patients.

<table>
<thead>
<tr>
<th>Causative agents</th>
<th>Frequency</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. Coli</em></td>
<td>44</td>
<td>66.66</td>
</tr>
<tr>
<td>pseudomonas aeruginosa</td>
<td>7</td>
<td>10.61</td>
</tr>
<tr>
<td>Acinetobacter baumannii</td>
<td>3</td>
<td>4.54</td>
</tr>
<tr>
<td>Candida Albican</td>
<td>1</td>
<td>1.52</td>
</tr>
<tr>
<td>Citrobacter Freundii</td>
<td>2</td>
<td>3.03</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>6</td>
<td>9.09</td>
</tr>
<tr>
<td>Providencia</td>
<td>1</td>
<td>1.52</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>2</td>
<td>3.03</td>
</tr>
</tbody>
</table>

In our study, out of 100 patients, urine culture was done only for 66 patients. In that, 44 of them (66.66%) showed the isolation of *E. coli* followed by isolation of pseudomonas aeruginosa in 7 cases (10.61%) than Klebsiella in 6 cases (9.09%), acinetobacter aeruginosa in 3 cases (4.54%), citrobacter freundii in 2 cases and staphylococcus aureus in 2 cases. Culture sensitivity test was done only in 66% of the total cases and the most common isolated organisms were *Escherichia coli* (66.66%), pseudomonas aeruginosa (10.61%), Klebsiella (9.09%).
Above table shows that the most frequently prescribed antibiotics were B-Lactam (34) (39.09%), cephalosporin 25(28.7%) and quinolones(13)(14.9%).

DISCUSSION

The most common infection in every age group is urinary tract infection, which may be due to physiological variations. When diabetes and HTN are found in chronic condition then there will be higher chances of UTI in that patient and eventually which may lead to mortality. The research work conducted by the pharmacist on the prescribing pattern of drugs in UTI becomes useful for the physicians so that better outcomes and better rational drug usage can be acquired.

In a study about National Patterns in the Treatment of UTI in Women by Ambulatory Care Physicians concludes that there is an increasing usage of nitrofurantoin and fluoroquinolones even though these are not recommended and not cost effective. One more study about the management of uncomplicated UTI has concluded that the combinations of trimethoprim and sulfamethoxazole and trimethoprim alone are considered as first-line therapy for uncomplicated UTI where resistance in the community is found to be <10-20%.⁵ One more
study about the management of uncomplicated UTI also concluded the same.\textsuperscript{[10]} In our study it was identified that the prevalence of UTI was high among females 65(59.09\%) than males 45(40.90\%). Similar results were found in a study conducted by\textsuperscript{[8]} Dinesh K in 2014 and contrast results were obtained by Mahesh et al. 2010,\textsuperscript{[11]} they identified that the prevalence was seen greater in males (63\%) than in females (37\%). In our study, more prevalence observed in age group of 61 to 70 years 25 (22.73\%), followed by 51-60 years 23 (20.91\%). Comparing to a study conducted by Dinesh K\textsuperscript{[8]} confirming that the prevalence of UTI is high in elderly patients as compared to young individuals. Most common UTI were pyelonephritis (84)(76.36\%) and cystitis 26(23.64\%). Among all, sent for culture sensitivity, \textit{E. coli} (66.66\%) topped the organisms list causing UTI that was similar to studies performed worldwide including Chen et al.\textsuperscript{[13]}, Peterson et al.\textsuperscript{[14]} Arslan et al\textsuperscript{[12]} and also by Nicolle.\textsuperscript{[15]} In our study, the other organisms isolated from culture were \textit{S. aureus} (3.03\%), \textit{Klebsiella} (9.09\%), and \textit{Pseudomonas} (10.61\%). All these suspects were previously treated with empirical antibiotics.

In our study B-Lactam 34 (39.04\%) were the most highly prescribed antibiotics for the empirical treatment of UTI, followed by cephalosporin 25 (28.7\%) and then Quinolones 13 (14.9\%). Comparing to other studies conducted by Panayapan et al found that out of 124 antibiotics used in 100 patients, ceftriaxone in 44 cases (35.48\%), amikacin in 28 cases (22.58\%) than ciprofloxacin in 20 cases (16.12\%), nitrofurantoin in 18 cases (14.51\%) followed by ofloxacin in 6 cases (4.83\%) and in other study showing contrasting results conducted by Dhodi DK \textsuperscript{8} et al found that quinolones were the most highly prescribed antibiotics for empirical therapy of UTI followed by cephalosporin, then penicillin and cotrimoxazole. According to the standard guideline of infectious disease society guideline recommend ciprofloxacin 500mg po bd in acute uncomplicated cystitis and acute uncomplicated pyelonephritis. as alternative therapy it recommend fosfomycin 3g x 1po or amoxi/clav 625mg tds or cefixime 400mg od in acute uncomplicated cystitis where as in acute uncomplicated pyelonephritis infectious disease society guideline recommend ceftriaxone 1g bd +Amikacin 15mg/kg od or imipenem 500mg q 6h or meropenem 500mg q 8h as alternative therapy in adults. our finding reflects that B-Lactam 34 (39.04\%) were the most highly prescribed antibiotics for the empirical treatment of UTI, followed by cephalosporin 25 (28.7\%) and then Quinolones 13 (14.9\%). which is approximately similar to the infectious disease guideline for the treatment of cystitis and pyelonephritis in adults.
CONCLUSION
The outcome of this study may not be illustrative of the all-general population; but rather UTIs are regularly treated empirically and susceptibility tests are frequently completed just when the patient has failed at least one or more courses of antibiotic. These information might be utilized to decide trends in antimicrobial susceptibilities and to formulate nearby antibiotics policies, to compare local and national data and generally speaking to help clinicians in the objective decision of antimicrobial treatment to anticipate abuse, or abuse of antibiotics. As fewer new antibiotics are available for management, we need to be concerned of this issue in years to come especially in tertiary care centers. A unified antibiotic etiquette is necessary to limit this increase and reduce the squeal of UTI.

REFERENCES
8. Dinesh K. Dhodi, Sarita Jaiswar, Sagar B. Bhagat, Rohini S. Gambre A study to evaluate prescribing pattern of antibiotics among patients of urinary tract infection with


