ABSTRACT
Antibiotics are one of most common drugs prescribed in hospital today. It has been estimated that up to one third of all patients receive at least one antibiotics during hospitalization. The cost involved is therefore correspondingly high and up to 40% of a hospital’s drug expenditure may be devoted to the purchase of antibiotics. Urinary tract infection (UTI) is a very commonly noted entity in clinical practice. UTI is defined as the presence of bacteria in urine along with symptoms of infection. Antimicrobials are used commonly for urinary tract infection. But if they are used irrationally then it increase chances of resistance of bacteria as well as increase in duration of morbidity and total cost of therapy. Cephalosporins are now widely been used in UTI, but emerging resistance is a problem to that. The main objective of this study was to find prescribing pattern of Cephalosporins in Urinary tract infections.

KEYWORDS: Cephalosporins, Resistance pattern, prescribing pattern, Urinary tract infection, E.coli.

INTRODUCTION
Urinary tract infection (UTI) is defined as the presence of bacteria in urine along with symptoms of infection.[1] Urinary Tract Infection (UTI) is caused by pathogenic invasion of the urinary tract which leads to inflammatory response of the urothelium.[2] Anatomically UTI can be classified into lower urinary tract infection involving the bladder and urethra and upper urinary tract infection involving the kidney, pelvis, and ureter. The majority of the UTI occur due to ascending infection.[3] UTI is an extremely common condition that occurs in both male and female of all the ages. The prevalence and incidence of UTI is higher in women than in men due to several clinical factors including anatomic differences, hormonal effects, and behavioral pattern.[4] UTI is mostly caused by gram negative aerobic bacilli...
found in the GI tract. These includes E. coli, Klebsiella, Enterobectoe, Citrobecter and Proteus. Other common pathogens include staphylococcus epidermis, staphylococcus saprophytic us and enterococcus species.\textsuperscript{[5]} The spectrum of presentation of UTI may be Asymptomatic Bacteriuriu, Asymptomatic acute urethritis and cystitis, Acute pyelonephritis, Acute prostatitis, Septicemia (usually gram negative).\textsuperscript{[6]}

UTI is the second most common infectious disease in the community medical practice. Worldwide, about 150 million people are diagnosed with UTI each year, costing an excess of 6 billion dollars. The resistance pattern of community acquired uropathogens has not been extensively studied in Indian subcontinent.\textsuperscript{[7, 8]} UTIs account for more than 100,000 hospital admissions annually, most often for pyelonephritis. They also account for at least 40% of all hospital acquired infections; the majority of these cases are catheter associated.\textsuperscript{[8]} UTI may lead to life threatening complications like sepsis and renal scaring. Renal scaring is the most common cause of hypertension in later childhood and renal failure in adults. Recognition of UTI in children should be made as early as possible to prevent these complications. Therefore, investigations for early diagnosis of UTI are of most importance.\textsuperscript{[9]} Two clinical entities are recognized in patients with symptomatic UTI: lower UTI (cystitis) and upper UTI (pyelonephritis).\textsuperscript{[10]}

Cephalosporins are broad spectrum antibiotics similar to penicillins. They have a beta-lactam ring which interferes with bacterial cell wall synthesis by binding to penicillin binding proteins, eventually leading to cell lysis and death. Cephalosporins are one of the mainstays of therapy and third generation cephalosporins are the first line agents for treatment of complicated UTIs including those of nosocomial origin.\textsuperscript{[11]} Cefotaxime is used in complicated urinary tract infections, lower respiratory tract infections, bacteremia, meningitis uncomplicated gonorrhea, infections of skin and soft tissue and of bone and joints, and obstetric and gynecological infections.\textsuperscript{[12]}

Cefepime has been useful in treatment of respiratory tract infections, UTI, skin and skin structure infections and in bacteremia.\textsuperscript{[13]} For infections caused by ESBL-producing \textit{E coli} or \textit{Klebsiella} species, Cefepime and piperacillin-tazobactam have been successful.\textsuperscript{[14]} However, the indiscriminate use of third generation cephalosporins and increasing reports of bacterial resistance especially \textit{Klebsiella}, \textit{Pseudomonas} and many strains of \textit{E coli} make it necessary to investigate new compounds.
One hundred bacteria isolates belonging to the family Enterobacteriaceae identified from different clinical specimens. These were subjected to antibiotic susceptibility testing to third-generation cephalosporins, 68% samples were resistant.\textsuperscript{[15]} Cephalosporins, have a $\beta$ lactam ring, which can be hydrolyzed by $\beta$ lactamases which by destroying the beta-lactam ring of this antibiotic class, ensures resistance.\textsuperscript{[16]} One approach to counteracting this resistance mechanism has been through the development of beta-lactamase inactivators like clavulanic acid and sulbactam tazobactam, molecules with minimal antibiotic activity. However, when combined with safe and efficacious penicillins or cephalosporins, these inhibitors can serve to protect the familiar beta-lactam antibiotics from hydrolysis by penicillinases or broad-spectrum beta-lactamases.\textsuperscript{[17]}

The present review has shown that third generation cephalosporins were the most common prescribed antibiotic (Table 1) This is in agreement with earlier study Bay and Anacleto \textsuperscript{[19]} whereas it is in contrary to the result of Mohan \textit{et al.}\textsuperscript{[17]} where amikacin is the most common prescribed antibiotic in the treatment of UTI.

**Resistance pattern** seen in the **top organisms** isolated from the study samples when tested with various Antibiotics in Microbiology department for culture sensitivity reports shown that E.coli was highly resistant to Cefotaxime followed by Cefeperazone as shown in Table no.2.\textsuperscript{[21]}

**Table no: 1 Use of Antimicrobials According to Age.\textsuperscript{[18]}**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Antibiotic class</th>
<th>&lt;10</th>
<th>10-20</th>
<th>20-40</th>
<th>40-60</th>
<th>&gt;60</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cephalosporins</td>
<td>1</td>
<td>2</td>
<td>15</td>
<td>31</td>
<td>27</td>
<td>76 (70.37)</td>
</tr>
<tr>
<td>2</td>
<td>Fluoroquinolones</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>23</td>
<td>13</td>
<td>42 (38.89)</td>
</tr>
<tr>
<td>3</td>
<td>Aminoglycosides</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>17 (15.74)</td>
</tr>
<tr>
<td>4</td>
<td>Penicillins</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>11</td>
<td>17</td>
<td>32 (29.63)</td>
</tr>
<tr>
<td>5</td>
<td>Azithromycin</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>19 (17.59)</td>
</tr>
<tr>
<td>6</td>
<td>Nitrofurantoin</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>12 (11.11)</td>
</tr>
<tr>
<td>7</td>
<td>Doxycycline</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2 (1.85)</td>
</tr>
<tr>
<td>8</td>
<td>Cotrimoxazole</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2 (1.85)</td>
</tr>
</tbody>
</table>

Resistance pattern of E.coli which is the main cause of urinary tract infections.
DISCUSSION
In general practice, the therapeutic approach for UTI is primarily empirical and the main aim of the physicians is to treat as specifically as possible. The present study indicates the general trends of use of medicines in UTI. The literature review of various articles suggested that in numerous occasions cephalosporins are prescribed for treating urinary tract infections whereas microbes causing these disease such as E.coli, Klebsiella species are already getting resistant to cephalosporins. Regarding the use of antibiotics relatively high levels of availability and consumption of antibiotics in developing countries have led to higher incidence of inappropriate use and greater levels of resistance than in developed countries. Drug utilization studies have the potential to make objective evaluation and analysis of health professional’s work and provide them with feedback to thinking about their practice and looking for ways to improve their own performance. These studies should become a method of increasing job satisfaction and means of education for health professionals, rather than being perceived as threat or another bureaucratic burden. Antibiotic resistance is an emerging problem and has become a major threat to the medical field. Excessive and inappropriate use of antibiotic has been a major contributor to this ever growing problem.

CONCLUSION
To conclude, it is evident from the present study that for UTI antibiotics were commonly prescribed, most commonly prescribed antibiotics were Cephalosporins followed by
quinolones. Present findings together with previous ones are suggestive of need of periodic monitoring of antibiotic sensitivity pattern of the bacterial isolates to provide effective treatment and thereby to make it more cost effective particularly in the developing countries like India.

REFERENCES


