Abstract:
Aim- To determine the current trends in antibiotic susceptibility pattern of E. coli at a tertiary care hospital in, in-patients with urinary tract infections. Materials and methods- A retrospective analysis was done in Tirunelveli Medical College Hospital on 3581 urine culture reports issued for suspected urinary infections in, inpatients of the hospital during a 6months period. The common microorganisms causing urinary tract infections and microbial drug sensitivity pattern were analyzed on 578 samples which were found to be culture positive. Results- The common uropathogen identified was E.coli (38.2). The frequency of urinary infections in percentage was more in the age groups 0-9years (10.2) 50-59years (9.6) in males whereas in females it was more in the age group of 20-29(14.8). The aminoglycoside antibiotic amikacin showed the highest sensitivity (94.19) towards E.coli and cotrimoxazole showed the least sensitivity (15.9).Conclusion- E.coli is the predominant uropathogen identified in our hospital, showing the highest sensitivity to the amino glycoside, amikacin and the least sensitivity to cotrimoxazole.

Keyword : UTI, E.coli, amikacin, cotrimoxazole

Introduction:
Urinary tract infections (UTIs) are among the most common infections experienced by humans. The vast majority of uncomplicated UTIs are caused by the Gram-negative bacillus Escherichia coli, followed by the other pathogens including Proteus mirabilis, Klebsiella, Enterococci, pseudomonas and staphylococcus. Early and effective antimicrobial therapy for UTIs significantly reduces renal scars and their consequences such as chronic renal disease and hypertension. Therefore in patients with suspected UTI, antibiotic treatment is usually started empirically, before urine culture results are available. The extensive and inappropriate use of antimicrobial agents has invariably resulted in the development of antibiotic resistance which, in recent years, has become a major concern.
problem worldwide. The prevalence of antimicrobial resistance in both out patients and in patients with UTI is increasing and can vary according to geographical and regional location. To ensure appropriate treatment, knowledge of the organisms that cause UTI and their antibiotic susceptibility is mandatory. As the emergence of resistant bacteria is growing worldwide, the choice of antimicrobial therapy should be based on the local experience of sensitivity and resistance patterns. Also, the degree of exposure of a population to specific antibiotics could play a role in the varying susceptibility.

Escherichia coli is the most frequently found bacteria in community acquired (85%) and of hospital acquired (45%) UTI patients.4

Justification:
The most common nosocomial infection is urinary tract infection (UTI). Scanty data are available regarding the sensitivity pattern of E.coli in nosocomial UTI in our hospital. This study was undertaken to assess the local susceptibility pattern and to guide the treating physicians in selecting drugs for presumptive therapy of UTI.

Aim
To determine the current trends in antibiotic susceptibility pattern of E. coli in, In-patients with urinary tract infections at a tertiary care hospital.

Materials and methods
This observational study was done by retrospective analysis of the urine culture report record sheets maintained in Microbiology laboratory of Tirunelveli Medical College Hospital. Analysis was done with 3581 urine culture reports issued for suspected urinary infections from samples collected from inpatients of the hospital during a 6months period from January-June 2010 after approval by the Institutional Ethics Committee. From the record sheets, age and sex of patients, microbial species (as recorded in urine culture reports), drug resistance and sensitivity pattern as recorded in antibiogram forms were analysed. Out of the 3581 samples analysed, 578 samples were found to be culture positive. The common microorganisms causing urinary tract infections were assessed. Microbial drug sensitivity pattern done by disk diffusion method for the culture positive samples was analyzed. Susceptibility of E.coli for the common antibiotics used in our hospital (aminoglycosides, gentamicin, ciprofloxacin, norfloxacin, cefotaxime, ceftriaxone, cotrimoxazole) was assessed.

Statistical analysis of the obtained data was done by chi-square test and descriptive statistics. Results Out of the 578 positive reports surveyed, 319 samples (55.1%) were from males and 259 (44.8%) from females (p<0.01). The frequency of urinary infections was more in the age groups 0-9years (10.2%) & 50-59years (9.6%) in males whereas in females it was more in the age group of 20-29(14.8%).

Fig. 2 Age and Gender distribution of UTI

The common uropathogen identified in our study was E.coli (38.2%) n=220

The other causative organisms for UTIs identified were K. pneumoniae (16.75%), K. oxytoca (11.07%), Citrobacter koseri (10.3%), Pseudomonas (8.47%), Staphylococcus (3.63%),
**Distribution of bacteria causing UTI**

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>38.2%</td>
</tr>
<tr>
<td>K. pneumonia</td>
<td>22.0%</td>
</tr>
<tr>
<td>K. oxytoca</td>
<td>13.7%</td>
</tr>
<tr>
<td>C. koseri</td>
<td>10.3%</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>5.7%</td>
</tr>
<tr>
<td>Staphylococcus</td>
<td>3.7%</td>
</tr>
<tr>
<td>Enterobacter</td>
<td>16.3%</td>
</tr>
<tr>
<td>Misc</td>
<td>19.1%</td>
</tr>
</tbody>
</table>

The incidence of UTI in our study was bimodal in distribution in males, the frequency being higher in 0-9 year group (10.2%) and also in 50-59 years group (9.6%). The reasons for this being, urological anomalies are common in younger males and prostatic problems are more in older males. The incidence in females was the highest (14.8%) in the 20-29 years group which includes the reproductive age. These results are in accordance with literature.1,3

In our study, E.coli was the most frequent uropathogen with the frequency of 38.2% of all isolates. This corresponds with the data obtained by other investigators in our country8-11 Similar frequency has also been reported in studies from other countries such as Bangladesh, U.K and Iran 12-14. The other pathogens isolated in our study were K.pneumonia, K.oxytoca, C.koseri, Psudomonas, Staphylococcus and Enterobacter in the order of frequency.

In this study Aminoglycosides showed higher sensitivity towards E.coli, percentage being the highest for amikacin (94.19) followed by gentamicin (50.90). Studies by Rai GK et al, Mohammad Tariq Mehmet aland Yilmaz et al have also found E.coli to be most sensitive to Amikacin15-17. This observation shows that though Aminoglycosides have been in use for quite a long period in the history of infectious diseases, they have not considerably developed much resistance. The susceptibility pattern of Quinolones reveals a lower sensitivity for E.coli, (ciprofloxacin 21.81%, Norfloxacin 18.18%. Increasing antimicrobial resistance to fluoroquinolones is being observed world-wide. Some authors have found that quinolone resistance is higher in developing countries than in developed nations because of the use of the less active quinolone, such as nalidixic acid,
Regarding cephalosporins, sensitivity to E.coli was 34.54% with cefotaxime and 30.45% with ceftriaxone. Intermediate sensitivity of E.coli to this third generation cephalosporin group of antimicrobials may be due to the expression of Extended Spectrum of Beta-Lactamases (ESBL), the enzymes that destroy cephalosporins by hydrolyzing their -lactam nucleus 14, 19, 20.

The antimicrobial with least sensitivity to E.coli noticed was Cotrimaxazloe (15.9%). Abdollah karim et al and Dilnawaz sheik et al have also reported similar pattern of sensitivity for cotrimoxazole (26%, 25%). Development of resistance against this drug might be due to its wide spread use21.

Sensitivity pattern in UTI is changing day by day and it varies from hospital to hospital even in the same city and country to country. Uropathogens are gaining resistance at an increased rate to commonly used antimicrobials as revealed in our and other studies. The local surveillance tailored empiric therapy and the newer trends like antibiotic recycling and mutant selection window hypothesis could limit the process of resistance development to uropathogens 23,24.

Conclusion:
Our retrospective study reveals E.coli as the predominant uropathogen in our hospital, showing the highest sensitivity to the amino glycoside, amikacin and the least sensitivity to cotrimoxazole. The judicious use of antimicrobials by the health professional and efforts to control procurement and use of antibiotics officially will probably help to limit the increasing rate of drug resistance in these pathogens.

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