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ANTIMICROBIAL SENSITIVITY PATTERN OF E.COLI IN URINARY TRACT INFEC-TION-A RETROSPECTIVE ANALYSIS

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Abstract :

antibiotic susceptibility pattern of E. coli at moxazole. a tertiary care hospital in, in-patients with urinary tract infections. Materials and moxazole 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 treatment is usually started empirically, 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, ami-Aim- To determine the current trends in kacin and the least sensitivity to cotri-

Keyword :UTI, E.coli, amikacin, cotri-

Introduction:

Urinary tract infections (UTIs) are among the most common infections experienced by humans. The vast majority of uncomplicated UTIs are caused by the Gramnegative bacillus Escherichia coli, followed by the other pathogens including Proteus mirabilis, Klebsiella, Enterococci, pseudomonas and staphylococcus¹. Early and effective antimicrobial therapy for UTIs significantly reduces renal scars and their consequences such as chronic renal disease and hypertension^{2, 3}. Therefore in patients with suspected UTI, antibiotic 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

icrobial resistance in both out patients and in antibiogram forms were analysed⁸. patients with UTI is increasing and can vary Out of the 3581 samples analysed, 578 according to geographical and regional loca- samples were found to be culture position. To ensure appropriate treatment, knowl- tive. The common microorganisms causedge of the organisms that cause UTI and ing urinary tract infections were astheir antibiotic susceptibility is mandatory. As sessed. Microbial drug sensitivity pattern the emergence of resistant bacteria is grow- done by disk diffusion method for the ing worldwide, the choice of antimicrobial culture positive samples was analyzed. therapy should be based on the local experi- Susceptibility of E.coli for the common ence of sensitivity and resistance pat-antibiotics used in our hospital terns. Also, the degree of exposure of a (amikacin, gentamicin, ciprofloxacin, population to specific antibiotics could play a norfloxacin, cefotaxime, ceftriaxone, corole in the varying susceptibility.

Escherichia coli is the most frequently found Statistical analysis of the obtained bacteria in community acquired (85%) and of data was done by chi-square test and hospital acquired (45%) UTI patients⁴.

Justification :

The most common nosocomial infection is ples (55.1%) were from males and 259 urinary tract infection (UTI). Scanty data are (44.8%) from females (p<0.01). The freavailable regarding the sensitivity pattern of quency of urinary infections was more in E.coli in nosocomial UTI in our hospital. This the age groups 0-9years (10.2%) & 50study was undertaken to assess the local 59years (9.6%) in males whereas in fesusceptibility pattern and to guide the treat- males it was more in the age group of ing physicians in selecting drugs for pre- 20-29(14.8%). sumptive 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

problem worldwide. The prevalence of antim- and sensitivity pattern as recorded in

trimoxazole) was assessed.

descriptive statistics. Results Out of the 578 positive reports surveyed, 319 sam-

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. peumoniae (16.75%), oxytoca (11.07%),Κ. Citrobacter koseri (10.3%), Pseudomonas (8.47%), Staphylococcus (3.63%),

E n t e r o b a c t e r (2.24%), The incidence of UTI in our study was biand misc. (9.16%)**Fig.1. Distribution of** modal in distribution in males, the frebacteria causing UTI Table: quency being higher in 0-9 year group 1 Antimicrobial susceptibility pattern of E.coli causing UTI (9.6%). The reasons for this being,



The aminoglycoside antibiotic amikacin shows the highest sensitivity (94.19%) towards E.coli and cotrimoxazole shows the least sensitivity (15.9%).

Discussion;

In community and hospital settings the etiology of UTIs and the antimicrobial susceptibility of microbial agents causing UTI have been changing over the years^{5,} ⁶. Over the last decade, the treatment of choice for urinary tract infections (UTIs) has changed from co-trimoxazole to quinolones owing to the rate of resistance to co-trimoxazole and its high level of therapeutic failure⁷.

The present study reveals the distribution of uropathogens and susceptibility pattern of E.coli, the commonest pathogen isolated from inpatients with UTI. Our study was done in order to be able to recommend the most appropriate antibiotics for UTI while awaiting culture results.

Regarding sex distribution, there was a 21.81%, Norfloxacin 18.18%. Increasing male preponderance (55.1%) in our study antimicrobial resistance to fluoroquiin contrast to other studies^{6, 7}. The possible reason for the same could be the higher number of samples received from the urology in-patients to the microbiology laboratory during the study period.

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 Iran¹²⁻ 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 Mehet 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 guite 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 resistance to fluoroauinolones is being observed world-wide. Some authors have found that quinolone resistance is higher in developing counthe use of the less active quinolone, such as nalidixic acid,

Regarding cephalosporins, sensitivity to References: 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 use^{21,}

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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