



ANTIBIOTIC PROFILE IN E.COLI URINARY TRACT INFECTION

General Medicine

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ABSTRACT

The study is done to assess the antibiotic profile of E. coli causing urinary tract infection.

This is an observational study, total of 100 urinary samples tested only for E. coli were analysed for antibiotics sensitivity & resistance Pattern. In this antibiotic era frequent & improper use of antibiotics has given rise to altered sensitivity & resistance pattern. This study has shown the spectrum of variation of various antibiotics. The study has shown E. coli is highly sensitive for Amikacin, Meropenem and resistant for Nalidixic acid, β -lactam group of drugs, most of Cephalosporins, Ciprofloxacin & Cotrimaxazole.

KEYWORDS

Antibiotic profile, Urinary tract infection, E .Coli

INTRODUCTION:

E.Coli is a gram negative bacteria and the most common cause of urinary tract infection (1).E.Coli causes both community acquired and nosocomial UTI, accounting for 75-90% of all UTI (2). Global incidence of E.coli urinary tract infection is 150 million. In comparison 60% of women have life time risk & males have 13% risk of developing urinary tract infection (3)

Whenever the patients presents with symptoms of UTI an empirical antibiotic is prescribed pending the culture and sensitivity report, which is essential for the appropriate selection of antibiotic.(3)The antibiotic spectrum of UTI is varying continuously over the years both at the hospital& community (4).In developing world the varying sensitivity and resistance pattern is of serious health issue. Also there is rise of ESBLase producing E.coli accounting for 17% of community& 18% of nosocomial UTI (5)

MATERIALS AND METHODS

Type of study: Retrospective observational study

Study material: Urine samples positive for E.coli

Place of study: Out Patient Services, Department of Medicine, Dr RML Hospital, with a study period of 4 months.

Inclusion criteria: Urine culture positive for E.coli & its sensitivity pattern with the following:

1. Age group ≥ 15 years
2. Patients presenting to Medicine OPD with symptoms of UTI
3. Both Sexes

Exclusion criteria: Urine culture showing mixed organisms

METHOD: Culture method used is Kirby Baur disc diffusion method.

Antibiotics used: β - lactams And ESBL group of drugs, Amino glycosides, Cephalosporins, Glycopeptide, Cotrimaxazole, Quinolones, monobactam, carbapenems, Tegecycline, Colistin, Nitrofurantoin, Fosfomycin.

Demographic data & sensitivity pattern of antibiotics recorded. Data analysed using descriptive Statistics

RESULTS: Total 100 patients tested positive for E.coli includes 65 females and 35 males.

Females of the reproductive age group are affected as follows, 15-24 age [66.66%], 25-34 age [73.91%], and 35-44age [73.33%]. After the reproductive age there is slight increase in the ≥ 65 years [59.09%].

Males of the middle and later age group are affected as follows, 45-54 age [41.66%], 55-64 age [42.10%], ≥ 65 age [40.90%].

This is illustrated in the table no 1.

Sensitivity and Resistance pattern:

Among all the antibiotics amikacin and meropenem are completely sensitive to treat E.coli urinary tract infection.

The resistant antibiotics consist of Ampicillin, Amoxicillin group and

Cephalosporin's mainly. Also included in the resistant group are nalidixic acid, ciprofloxacin, cotrimaxazole & others. This has been represented in the table no 2. Also resistance shown by each tested drug has been documented in the bar diagram of the .no.1 & 2.

DISCUSSION:

The study shows females of reproductive age group 25-44 years are more susceptible to E.coli urinary tract infection. In females the short urethra and closeness to the anus appears to be responsible for the bacteria to seed in urinary tract to cause infection; Faecal-perineal-urethral contamination. Also altered vaginal flora plays a part in urinary tract infection (6)

The study has also shown a slight increase of E.coli urinary tract infection in the advancing age group. This incidence may be associated with improper bladder emptying, decreased estrogenic secretion causing vaginal atrophy and altered vaginal flora.(6)

Among males middle and later age group are susceptible to E.coli urinary tract infection. This may be related to Prostatic hypertrophy and bladder dysfunction.

The present study shows E.coli is completely sensitive to Amikacin (7) and meropenem. The study conducted by Sung Eon et al also suggests E.coli is sensitive to Amikacin and Carbapenem drugs. Also highlighted that amikacin can be used as a single daily agent in the OPD setting. (7, 8) Fosfomycin still remains sensitive single oral agent but the resistance is growing. (9)

As per the study of Yo Bin Seo et al Piperacillin–Tazobactam and Etrapenem can be used to treat nosocomial urinary tract infection (10).As our study also shows high sensitivity rate to Piperacillin –Tazobactam and carbapenem and Cefixime also. Nitrofurantoin can still be used as an oral agent with the sensitivity of 86% in our study.

High rate of resistance noted with Nalidixic acid, beta lactam, cephalosporin group of drugs except cefpime and cefixime which can be used to treat E.coli urinary tract infection. Similar results were found in the study conducted by Talat El Syed et al (11, 12).

CONCLUSION:

In the present antibiotic era frequent and in appropriate use has resulted in altered antibiotic profile of sensitivity and resistance pattern. This has resulted in a serious health issue in picking a proper antibiotic to treat urinary tract infection. Culture & sensitivity of urine plays a major role in the selection of a proper antibiotic to treat urinary tract infection. By this the emergence of resistance to the drugs can be minimised. Drugs should be selected as per the sensitivity pattern & to be used adequately for the proper period of urinary tract infection.

Table 1.

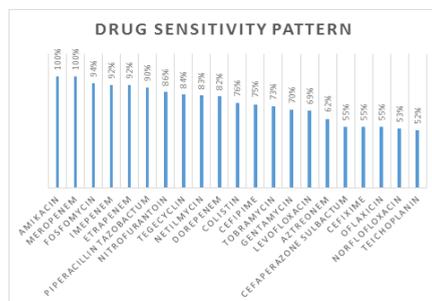
Age group years	Male	Female	Total
15-24	3(33.33%)	6(66.66%)	9
25-34	6(26.08%)	17(73.91%)	23
35-44	4(26.66%)	11(73.33%)	15

45-54	5(41.66%)	7(58.33%)	12
55-64	8(42.10%)	11(57.89%)	19
≥65	9(40.90%)	13(59.09%)	22
	35	65	100

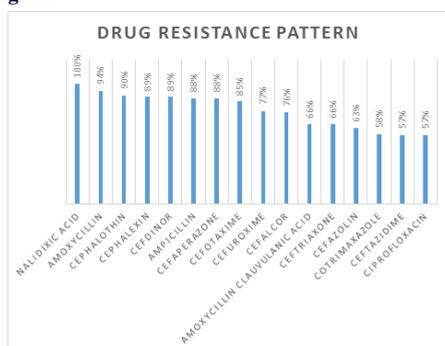
Table 2, Drugs sensitivity and resistance pattern

Percentage	Sensitivity	Resistance
100%	Amikacin, Meropenem	Nalidixic acid
99-90%	Fosfomycin (94%), Etrapanem (92%) Imepenem (92%) Piperacillin –Tazobactum (90%)	Amoxicillin (94%), Cephalothin (90%)
89-80%	Nitrofurantoin (86%) Tegecyclin (84%), Netilmycin (83%) Dorepenem (82%)	Cefdinor (89%), Cephalexin (89%), Ampicillin (88%), Cefaperazone (88%) Cefotaxime (85%),
79-70%	Colistin (76%), Cefpime (75%), Tobramycin (73%), Gentamycin (70%)	Cefuroxime (77%) Cefalcor (76%)
69-60%	Levofloxacin (69%) Aztreonem (62%)	Amoxicillin-Clavulanic acid (66%), ceftriaxone (66%), Cefazolin (63%)
59-50%	Cefaperazone-Sulbactam (55%), Ofloxacin (55%), Cefixime (55%) Norflaxacin (53%), Teichoplanin (52%)	Cotrimaxazole (58%) Ciprofloxacin (57%) Ceftazidime (57%)

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Bar diagram 1



Bar diagram 2

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