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ORIGINAL ARTICLE

A STUDY ON ANTIBIOTIC RELATED RESISTANCE IN UTI PATIENTS: A COMPARISON BETWEEN COMMUNITY ACQUIRED AND HOSPITAL ACQUIRED E. COLI

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ABSTRACT

Background: UTI (urinary tract infection) is the most common among all hospital acquired infections world wide. In UTI, most common organism is *E.coli*. Organism responsible for the hospital acquired infection may have tendency to develop multiple drug resistance. *E.coli* acquired from the hospital source and community source may differ in their resistant against antibiotics

Aim: to study and to compare the antibiotic resistant pattern with special reference to ESBL (extended spectrum β lactamase) in the community acquired and hospital acquired common gram negative bacilli causing UTI.

Methods and materials: *E.coli* from symptomatic UTI cases from both community acquired and hospital acquired UTI were tested for the antimicrobial susceptibility testing against 18 drug of various groups performed by Kirby Bauer's disc diffusion method. Isolates resistant to third generation cephalosporin were tested for ESBL production by double disk synergy test method.

Results: Overall *E.coli* was (70.96%) among the all gram negative bacilli of UTI patients. The majority (67%) of the isolates were from female. ESBL prevalence was 16.67% and 30% among community acquired and hospital acquired *E.coli* respectively. Cephalosporin group of sensitivity was widely varied among both the group compare to other groups of antibiotics and more resistance was found in hospital strain

Discussion and Conclusion: Almost double prevalence of ESBL among hospital strain compared to community strain leads to change in line of management when a hospitalized patient has tendency to develop UTI, plain cephalosporin should not be administered in other diseases also.

Keywords: Antibiotic resistance, UTI, E. Coli

INTRODUCTION

Urinary tract infection (UTI) is most common infectious presentation in hospital acquired and community acquired infections since long time.[1, 2] There are an estimated 150 million urinary tract infections per annum worldwide and cost the global economy in excess of 6 billion US dollars. [3]A limited and predictable spectrum of organisms is responsible urinary tract infections. Among both outpatients and inpatients, Escherichia coli is the primary urinary tract pathogen, accounting for 75% to 90% of both side - hospital acquired and community acquired UTI. [4, 5]

UTIs are often treated with different broad-spectrum antibiotics when one with a narrow spectrum of activity may be appropriate because of concerns about infection with resistant organisms. Fluoroquinolones are preferred as initial agents for empiric therapy of UTI in area where resistance is likely to be of concern.[6, 7] This is because they have high bacteriological and clinical cure rates, as well as low rates of resistance, among most common uropathogen.[7-9] The extensive uses of antimicrobial agents have invariably resulted in the development of antibiotic resistance, which, in recent years, has become a major problem worldwide. [10] The Infectious Diseases Society of America also

Table 2: Frequency and resistance pattern of E. coli isolated from UTI against 18 selected antimicrobial agents tested (n=66)

Group of Antibiotic	Antibiotic	Percentage (%) of resistance to antimicrobial agent	
		Community acquired UTI	Hospital acquired UTI
First generation cephalosporin	Cefadroxil	38	100
Second generation cephalosporins	Cefuroxime	44	100
Third generation cephalosporins	Cefotaxime	27	55
	Ceftriaxone	28	35
	Cefoperazone	27	50
	Ceftazidime	16	30
	Cefixime	38	90
Forth generation cephalosporins	Cefepime	16	20
ESBL producers (%)		16.67	30
	piperacillin	44	80
Monobactam	Aztreonem	27	50
Carbapenems	Imipenem	0	0
Fluoroquinolones	gatifloxacin	1	0
	levofloxacin	5	0
others	tetracycline	55	40
	Chloramphenicol	11	20
	nitrofurantoin	16	20
Aminoglycosides	amikacin	3	5
	gentamicin	11	20

DISCUSSION AND CONCLUSION

Antibiotic resistance is a major clinical problem in treating infections. The resistance to the antimicrobials has increased over the years. Resistance rates vary from place to place. [14] Though bacterial urinary tract infection is common, it is not always possible to do bacterial culture and antibiotic sensitivity report for the treatment especially in small centers. Even where this test is done for in patients or out patients, many times initially antibiotics are started earlier before the arrival of report and afterward changes are made if required. For initial antibiotic treatment to be effective, we required knowledge about the prevalent sensitivity pattern among the bacterial causing UTI in our area and also must have the constant watch over the development of resistant

Overall 67 % infection occurred in female .Men are usually less prone to UTI as compared females, owing to the longer course of the urethra and bacteriostatic properties of prostate secretions. Among both group Quinolones have maintained a high level of activity against UTI isolates of E. coli. Other agents, such chloramphenicol, nitrofurantoin amikacin haven't developed significant resistance and no difference in resistance of both group observed.

But the beta lactam group resistance is more significantly ($p < .05$) in hospital group. This may be due to increased prevalence in beta lactamase with or without ESBL in hospital environmental bacteria. Though the bacterial spectrum causing community-acquired UTI remained the same over time, the antibiotic susceptibility has changed. [15] Worldwide ESBL prevalence in community and hospital widely varies. [16, 17] In the present study, 16.7% and 30% isolates were ESBL-positive for community and hospital acquired UTI. India has reported an ESBL positivity rate between 26.9% and 48.3%.[18-21] ESBL producers do not respond to the usually prescribed empirical therapy. Also, there is an increased risk of associated morbidity and mortality, and cost of therapy when these patients are put on the standard empirical therapy.[22] There should be constant watch over the local ESBL prevalence as there is report of ESBL positive up to 52% even in community acquired UTI [23] and the high rate of ESBL positivity will warrant a change in the empirical therapy for UTI to prevent the complications.

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