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Relationship between UTI and Antimicrobial Resistance in Rural People of Bangladesh

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Abstract **Original Research Article**

Objective: in this study our main goal is to evaluate the relationship between UTI and antimicrobial resistance in rural people Bangladesh. ***Method:*** This observational study was carried out in district sadar hospital, feni, Bangladesh from January 2016 to December 2018 among 100 patients with UTI who attending outpatient and inpatient departments of medicine. Data were compiled and analysed by appropriate statistical package for social science (SPSS). P value <0.05 was taken as minimum level of significance. ***Result:*** in this study, most of the patients belong to 31-40 years age group and 69% were female. Also, 75% positive culture of bacteriuria was found in female and most of the patients from rural and only 41% patients treated with antibiotic. ***Conclusion:*** From our study, we can say that E. coli is the most common uropathogen. Antibiotics such as amoxycillin, amoxiclav, cephradine and cefixime. have limited value for the treatment of UTI. Routine observing of susceptibility patterns is necessary, which will help in the empirical treatment of UTI to the clinicians and also for the planning of antibiotic policy of the individual foundation.

Keywords: Urinary tract infections (UTI), antibiotic resistance, amoxicillin.

INTRODUCTION

Urinary tract infections (UTI) are the most common infections in world .It is very much common in patients with diabetes and in those with structural and neurological deformities which interfere with urinary outflow. Nosocomial UTI is also common subsequent catheterization and cystoscopy. The indicators of UTI may vary from mild asymptomatic cystitis to pyelonephritis and septicemia. Gram-negative bacteria are the most common pathogens involved in UTI, but almost all known pathogens have been point the finger as possible causative agents for UTI. Treatment of UTI establishes a great portion of prescription of antibiotics.

Urinary pathogens have shown a changed configuration of susceptibility to antibiotics, resulting in an increase in resistance to commonly used antibiotics.

In modern medicine bacterial infection resistance to antibiotics is one of the most challenging global health threats. It has been assessed that by 2050, 10 million lives per year will be at risk from antibiotic-resistant infections. Urinary tract infection is a major public health problem in terms of morbidity and treatment cost which affecting 150 million people each year. It also characterizes the most common antibiotic-resistant infections in major care setting. It is a principal cause of repeated physician consultations and antibiotic resistance and problem for clinicians in choosing suitable antibiotic.

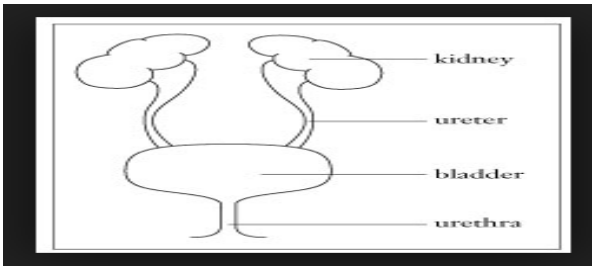

Fig-1: Urinary structure

In this study our main objective is to assess the relationship between UTI and antimicrobial resistance in rural people Bangladesh

OBJECTIVE

General objective

- To estimate assess the relationship between UTI and antimicrobial resistance in rural people Bangladesh.

Specific objective

- To identify the frequency of presence culture positive bacteriuria in relation to gender of patient.
- To evaluate the incidence of Isolation of organism in relation to gender of patient.

Methodology

Type of study	Observational study
Place of study	district sadar hospital, feni, Bangladesh
Study period	January 2016 to December 2018
Study population	100 patients with UTI attending outpatient and inpatient departments of medicine
Sampling technique	Purposive

METHOD

All the patients included in this study were above 20 years of age, presented with the suspected UTI (dysuria, frequency, fever and pain in lower abdomen). In this study, patients presented with active menstruation, PID, tubo-ovarian disease, appendicitis, colitis, epididymitis and orchitis diagnosed either clinically or by investigations were excluded from this study. Patients on antibiotic were advised to stop antibiotic for 48 hours and were included in this study.

STATISTICAL ANALYSIS

The results are given as Mean ± SD for the seven independently performed experiments. Unpaired student's "*t*" test was used to see the level of significance. P value <0.05 was considered statistically significant. ANOVA test was used to see the level of significance among comparison more than two groups, p value < 0.05 was considered statistically significant. Data were compiled and analysed by appropriate statistical package for social science (SPSS). P value <0.05 was taken as minimum level of significance.

RESULT

In table-1 shows age distribution of the patients where most of the patients belong to 31-40 years age group. The following table is given below in detail:

Table-1: Age distribution of the patients

Age group	%
21-30 years age group	10%
31-40 years age group	51%
41-50 years age group	17%
51-60 years age group	22%
Total	100%

In figure-2 shows gender distribution of the patients where most of the patients were female, 69% which was 38% higher than male. The following figure is given below in detail:

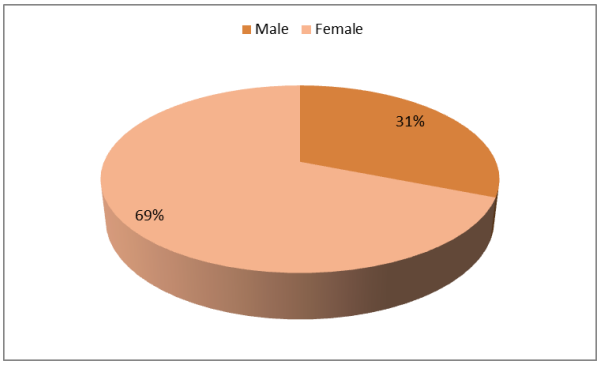

Fig-2: Gender distribution

In figure-3 shows Frequency of presence culture positive bacteriuria in relation to gender of patient where 75% positive culture of bacteriuria was found in female. The following figure is given below in detail:

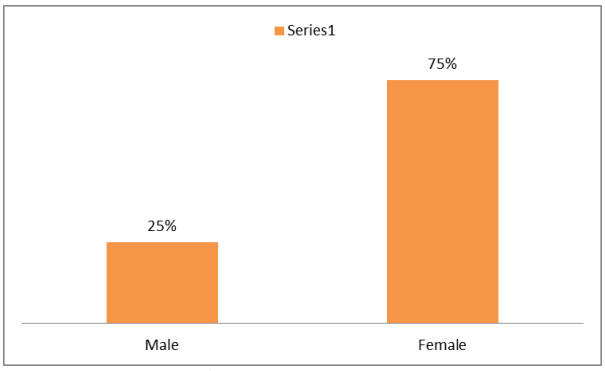

Fig-3: Frequency of presence culture positive bacteriuria in relation to gender of patient

In table-2 shows demographic characteristics of the CT-UTI patients where most of the patients from rural and only 41% patients treated with antibiotic the following table is given below in detail:

Table-2: Demographic characteristics of the CT-UTI patients

Demographic characteristics	%
Living area:	
Urban	12%
Rural	88%
Educational status:	
Primary	46.5%
Secondary	31%
Higher	22.5%
Material status:	
Married:	51%
unmarried	16%
others(separated, widow)	33%
Number of children:	
0-1	12%
2-3	74%
≥4	14%
Clinical symptom:	
Fever	57%
Dysuria	71%
Urgency	48%
Abdominal pain	36%
Treated with antibiotics	
Yes	41%
No	59%

In figure-4 shows incidence of Isolation of organism in relation to gender of patient where both male and female E. coli was ranked highest 41% and 43% among other isolated samples. The following figure is given below in detail:

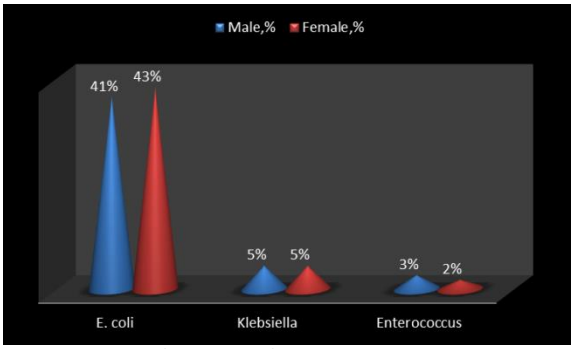

Fig-4: Incidence of Isolation of organism in relation to gender of patient

In table-3 shows In vitro antibiotics resistance pattern of the bacteria where high degree of resistance against commonly used antibiotics- amoxycillin, amoxiclav, cephradine and cefixime. The following table is given below in detail:

Table-3: In vitro antibiotics resistance pattern of the bacteria.

Name of antibiotics	Total no sensitive	%
Meropenem	1	0.5%
Imipenem	2	1%
Amikacin	2	1%
Tazobactum	1	.5%
Gentamycin	23	12%
Nitrofurantoin	20	10%
Mecillium	84	47%
Colistin	31	16%
Ceftriaxone	91	47%
Cefixime	130	60%
Amoxiclav	118	66%
Amoxicillin	91	47%

DISCUSSION

This study determines the distribution and antibiotic resistance pattern of bacteria isolated from patients with UTI from a tertiary care center. In our study, only 75% female had culture positive in patients with UTI symptoms which was similar to other study [6]. Higher occurrence of UTI in females (75%) than in males which is similar to other reports [7, 8]. It was because of anatomical and physical factors [9].

E. coli majority isolated organism which was expressively higher (p value was <0.01) than previous studies. Probable cause of this prevalence of intestinal bacteria was due to antibiotic therapy for treating infections outside the urinary tract which contaminate the urinary tract [10].

Bacteria demonstrations higher degree of resistance against most of the continuing antibiotics used for sensitivity due to irrational consumption of most of the antibiotics during the past decade in our region [11]. Resistance to amikacin is only 1% and it is cheap, so it is wise to use it as parental empirical antibiotics in UTI.

Resistance was suggestively increased in resistance pattern in year 2016 for ceftriaxone, and amoxiclav possibly because random use of these antibiotics with insufficient dose and period which is a public health concern in Bangladesh [12].

According to guideline by Infectious Diseases Society of America (IDSA) in the year 2011, an antibiotic is no longer suggested for empirical treatment of acute UTI if there is >20% resistance occurrence to that specific antibiotic [11].

The antibiotics displays resistance more than 20% is according to this guideline of IDSA, most of the antibiotics used in our study should not be used for experiential treatment of acute UTI.

In our country there is crucial need of constant monitoring with culture and sensitivity outline of

specific pathogens in different health care center. Community awareness program should be started for adherence to treatment protocol considering bacterial resistance and emerging multidrug resistant strains. It is essential to conduct a regional research on the culture and sensitivity patterns of the bacteria.

CONCLUSION

From our study, we can say that E. coli is the most common uropathogen. Antibiotics such as amoxycillin, amoxiclav, cephradine and cefixim have limited value for the treatment of UTI. Routine observing of susceptibility patterns is necessary, which will help in the empirical treatment of UTI to the clinicians and also for the planning of antibiotic policy of the individual foundation.

REFERENCE

1. Sobel JD, Kaye D. Urinary tract infections. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases. 5th ed. Philadelphia: Churchill Livingstone. 2000: 773–805.
2. Naveen R, Mathai E. Some virulence characteristics of uropathogenic Escherichia coli in different patient groups. Indian Journal of Medical Research. 2005 Aug 1;122(2):143.
3. Wilkie ME, Almond MK, Marsh FP. Diagnosis and management of urinary tract infection in adults. BMJ: British Medical Journal. 1992 Nov 7;305(6862):1137.
4. Bajaj JK, Karyakarte RP, Kulkarni JD, Deshmukh AB. Changing aetiology of urinary tract infections and emergence of drug resistance as a major problem. The Journal of communicable diseases. 1999 Sep;31(3):181-4.
5. Magalit SL, Gler MT, Tupasi TE. Increasing antimicrobial resistance patterns of community and nosocomial uropathogens in Makati Medical Center. Phil J Microbiol Infect Dis. 2004;33(4):143-8.
6. Majumder MI, Ahmed T, Hossain D, Begum SA. Bacteriology and antibiotic sensitivity patterns of urinary tract infections in a tertiary hospital in Bangladesh. Mymensingh Med J. 2014 Jan;23(1):99-104.
7. García-Morúa A, Hernández-Torres A, Salazar-de-Hoyos JL, Jaime-Dávila R, Gómez-Guerra LS. Community-acquired urinary tract infection etiology and antibiotic resistance in a Mexican population group. Revista Mexicana de Urología. 2009;69(2):45-8.
8. Boucher HW, Talbot GH, Bradley JS, Edwards JE, Gilbert D, Rice LB, Scheld M, Spellberg B, Bartlett J. Bad bugs, no drugs: no ESKAPE! An update from the Infectious Diseases Society of America. Clinical infectious diseases. 2009 Jan 1;48(1):1-2.
9. Khan AU, Musharraf A. Plasmid-mediated multiple antibiotic resistance in Proteus mirabilis isolated from patients with urinary tract infection. Medical science monitor: international medical journal of experimental and clinical research. 2004 Nov;10(11):CR598-602.
10. Chin TL, MacGowan AP, Bowker KE, Elder F, Beck CR, McNulty C. Prevalence of antibiotic resistance in Escherichia coli isolated from urine samples routinely referred by general practitioners in a large urban centre in south-west England. Journal of Antimicrobial Chemotherapy. 2015 Mar 11;70(7):2167-9.
11. Mudur G. Drug resistant cholera in India attributed to antibiotic misuse. BMJ. 2000 Dec 2;321(7273):1368.