Multi-drug resistant *Escherichia Coli* isolated from patients with urinary tract infection

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September 2021

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This is to certify that we have examined the above MPH (One Health) thesis and have found that it is complete and satisfactory in all respects, and all revisions required by the thesis examination committee have been made.

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List of Abbreviations

Abbreviation	Elaboration
UTI	Urinary Tract Infection
CA-UTI	Community-Acquired Urinary Tract Infection
N-UTI	Nosocomial Urinary Tract Infections
CAE	Cefuroxime Axetil
ExPEC	Extra intestinal pathogenic *E. coli*
MDR	Multi- Drug Resistant
TMP-SMX	Trimethroprim-Sulfamethoxazole
AMR	Antimicrobial Resistance
NDM	New-Delhi metallo-β- lactamase
VISA	Vancomycin-intermediate *S. aureus*
VRE	Vancomycin Resistant Enterococci
CRE	Carbapenem Resistant Enterobacteriaceae
PMQR	Plasmid-Mediated Quinolone Resistant
FPA	Food Producing Animals
CI	Confidence Interval

Abstract

Urinary tract infections (UTI) are among the most common infectious diseases in the world. They are caused by micro-organisms that infect the structures of the urinary tract. Almost 95% of all UTIs are caused by bacteria and majority of them are caused by *E. coli*. Due to emergence of resistance strains, UTI infections caused by *E. Coli* are becoming complicated day by day. Since most UTIs are treated empirically without any culture or sensitivity testing, there is clear knowledge gap about the existing patterns of resistance among our population. Hence, the aim of this study is to identify the drug resistance pattern of *E. coli* isolated from patients with urinary tract infections. In this cross-sectional study, secondary data were collected from a laboratory in the city of Chattogram. A total of 400 culture and sensitivity reports of urine were collected over a period of two years. Only the reports that came positive for *E. Coli* were included in this study. Among all the samples, that were included in this study, 383(95.7%) sample isolates showed resistance to at least three antibiotics. Around 22.5% (n=90) of the samples showed antimicrobial resistance to six drugs combinations. Among different combinations of drugs, around 35 sample isolates were resistant to the drug combination of Ampicillin-Cefuroxime-Ceftriaxone- Cefepime- Nalidixic Acid and Ciprofloxacin. It was the most frequent pattern. This study could not find any association between antibiotic resistance pattern and age. In case of gender, male population were significantly more resistant against antibiotics like Meropenem, Imipenem, Amikacin, Gentamycin and Nitrofurantoin as compared to the females. *Escherichia Coli* is the most frequent uropathogen to date. However, the choice of treatment is gradually becoming narrow due to the widespread resistance of previously used antibiotics. In such circumstances, strict policies should be implemented for prescribing and selling antibiotics. Additionally, regular surveillance is necessary to monitor the organisms that cause UTI along with their resistance patterns. Since the sensitivity patterns of *E. coli* differ based on geographical locations, susceptibility of the organism and its drug resistance pattern in different region must be studied for an effective treatment against the contagion.