

**CROSS-SECTIONAL STUDY OF URINARY PATHOGENS AND THEIR
ANTIBIOTIC SUSCEPTIBILITY PATTERN WITH REFERENCE TO
EXTENDED SPECTREUM BETA LACTAMASE (ESBL) PRODUCING
STRAINS IN KATHMANDU MODEL HOSPITAL**

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of
Master of Science in Microbiology
(Environment and Public Health)**

Submitted by

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ABSTRACT

Extended spectrum β -lactamases (ESBLs) hydrolyse expanded spectrum cephalosporins like ceftazidime, cefotaxime and monobactam aztreonam. ESBL producing bacteria may not be detectable in the routine disc diffusion susceptibility tests leading to inappropriate use of antibiotics and treatment failures. Thus, in order to detect antibiotic susceptibility pattern of urinary tract isolates of family enterobacteriaceae with reference to extended spectrum β -lactamase (ESBL) producing strain, a study was conducted among patients attending the outpatient department and hospitalized patients of Kathmandu Model Hospital, who were suspected of urinary tract infection (UTI) during the six months from 1-March-2006 to 31-August-2006.

Altogether, 435 urine samples collected were investigated by conventional semi-quantitative culture technique, microscopy, antibiotic susceptibility test and ESBL detection test.

Out of 435 urine samples, only 23.91% (104/435) showed significant growth. The highest percentage of growth positive samples 29.81% (31/104) belonged to the age group 20-30 years. Status of bacteriuria was found slightly higher in females (26.10% i.e. 71/272) than in males (20.25% i.e. 33/163) and higher in inpatients (28.17% i.e. 20/71) than in outpatients (23.08% i.e. 84/364). Among 104 isolates, *E. coli* (88.46%) was found to be the most predominant isolate followed by *Enterobacter aerogenes* (3.85%), *Acinetobacter* species (1.92%), *Pseudomonas aeruginosa* (0.96%), *Proteus vulgaris* (0.96%), *Citrobacter freundii* (1.92%) and *Staphylococcus aureus* (1.9%). Out of 104 isolates, 63 (60.6%) were MDR. And also among 104 isolates 16 (15.38%) were ESBL producing strain. The prevalence of ESBL strains was found to be higher (20.00% i.e. 4/20) in admitted patient than in outpatient 14.29% i.e. 12/84 and also the prevalence of ESBL strain was found to be higher in male (18.18% i.e. 6/33) than female (10/71). Out of 92 *E. coli* isolates, 16.30% i.e. 15/92 were ESBL strains while 25% i.e. 1/4 of *E. aerogenes* were found to be ESBL strains.

Based on invitro susceptibility test and phenotypic Double Disc Synergy Test (DDST), it was concluded that a significant number of urinary isolates are MDR and often co-produce ESBL, which can result in unavoidable treatment failures. No doubt the reporting of MDR and ESBLs and other β -lactamases should continue to challenge treatment strategy for years to come.

Key Words: MDR, ESBL, Double Disc Synergy test

LIST OF ABBREVIATIONS

BA	:	Blood Agar
cfu	:	Colony forming unit
DDST	:	Double Disc Synergy Test
ESBL	:	Extended Spectrum β -Lactamase
Gm	:	Gram
H ₂ S	:	Hydrogen Sulphide
KTM	:	Kathmandu
MA	:	MacConkey Agar
MBC	:	Minimum Bactericidal Concentration
MDR	:	Multi Drug Resistance
MIC	:	Minimum Inhibitory Concentration
ml	:	Millilitre
mm	:	Millimeter
MR	:	Methyl Red
MSU	:	Mid Stream Urine
NA	:	Nutrient Agar
NCCLS	:	National Committee for Clinical Laboratory Standards
O/F	:	Oxidative/Fermentative
R/Y	:	Red/Yellow (Alkali/ Acid)
RBC	:	Red Blood Cells
SIM	:	Sulphide Indole Motility
TSI	:	Triple Sugar Iron Agar
TUTH	:	Tribhuvan University Teaching Hospital
UTI	:	Urinary Tract Infection
VP	:	Voges-Proskauer
WBC	:	White Blood Cells
WHO	:	World Health Organization

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