

**MICROBIOLOGICAL STUDY OF URINARY TRACT  
INFECTION IN PATIENT VISITING PAROPAKAR MATERNITY  
AND WOMEN'S HOSPITAL, THAPATHALI, KATHMANDU**

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DISSERTATION  
SUBMITTED TO THE CENTRAL DEPARTMENT OF MICROBIOLOGY  
TRIBHUVAN UNIVERSITY**

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DEGREE OF MASTER OF SCIENCE IN MICROBIOLOGY  
(MEDICAL)**

**BY  
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This is to certify that **Miss BANDANA SUBEDI** has completed this dissertation work entitled “**MICROBIOLOGICAL STUDY OF URINARY TRACT INFECTION IN PATIENT VISITING PAROPAKAR MATERNITY AND WOMEN’S HOSPITAL, THAPATHALI, KATHMANDU**” as a partial fulfillment of Master of Science Degree in Microbiology under our supervision. To our knowledge, this work has not been submitted for any other degree.

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Bandana Subedi

## ABSTRACT

This study was conducted in patients visiting Paropakar Maternity and Women's Hospital, Thapathali, with an objective to assess the Microbiological study of Urinary Tract Infection. Annually, women and their neonates are in the risk of morbidity and mortality due to UTI in case of Nepal. In this study, a total of 1246 clinical samples of urine were collected. Prevalence of uropathogens was found 29.61% (369/1246). A total of 369 uropathogens of which 8 species from Gram negative (82.66%) and 4 species from Gram positive (17.34%) were isolated. In Gram negative, the most predominant was *E. coli* (62.3%) followed by *Klebsiella pneumoniae* (6.5%), *Proteus mirabilis* (4.9%), *K. oxytoca* (3%), *P. vulgaris* (2.7%), *Enterobacter cloacae* (0.5%) and *Citrobacter freundii* (0.5%). From Gram positive most prevalent were *Staphylococcus aureus* (7.6%) and coagulase negative staphylococci (CoNS) (7.6%) followed by *Streptococcus* spp. (1.4%) and *S. fecalis* (0.8%). The most efficient antibiotics in Gram negatives were found Tobramycin (87.54%). In *S. aureus* Amikacin (96.43%) was found more susceptible whereas for CoNS and *Streptococcus* spp. maximal efficient antibiotic was found Nitrofurantoin (75%). Altogether 199 Multidrug resistant strains were isolated. Highest percent of MDR were found in *K. pneumoniae* (58.33%) in Gram negatives and *S. aureus* (82.14%) in Gram positives urine isolates, a total of 14 Methicillin Resistant *Staphylococcus aureus* (MRSA) were isolated. All MRSA isolates were found to be Vancomycin sensitive. Multiple Antibiotics Resistance index (MARI) of isolates was found more than 0.20 in 247 (66.93%) of isolates. MARI of antibiotics was found highest in antibiotics Nalidixic acid in Gram negative and Moxifloxacin in *S. aureus* and Penicillin G in CoNS and *Streptococcus* spp. Previous antibiotics use was found significantly associated with MDR isolates ( $p=0.029$ ; OR=1.752 CI=1.159 and 2.650).

**Keywords:** host factors, MARI, uropathogens

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## LIST OF ABBREVIATIONS

A/A	:	Acid/ Acid
Alk/A	:	Alkali/ Acid
ARI	:	Antibiotics Resistance Index
AUC	:	Acute Uncomplicated Cystitis
BA	:	Blood Agar
CA-UTI	:	Community Acquired Urinary Tract Infection
CDC	:	Centre for Disease Control
CDM-T U	:	Central Department of Microbiology, Tribhuvan University
CFU	:	Colony Forming Units
CoNS	:	Coagulase Negative Staphylococci
DNA	:	Deoxyribonucleic Acid
DoHS	:	Department of Health Services
EC	:	European Commission
ESBL	:	Extended spectrum beta-lactamases
FRAT	:	Formula for Rational Antimicrobial Therapy
GISA	:	Glycopeptide-intermediate <i>Staphylococcus aureus</i>
H <sub>2</sub> S	:	Hydrogen Sulphide
HPF	:	High power field
Hrs	:	Hours
LF	:	Lactose fermenting
MA	:	MacConkey agar
MARI	:	Multiple Antibiotics Resistance Index
MDR	:	Multiple drug Resistance
MHA	:	Mueller Hinton Agar
MIC	:	Minimum Inhibitory Concentration
MoPH	:	Ministry of Public Health
MR	:	Methyl Red
MRSA	:	Methicillin-resistant <i>Staphylococcus aureus</i>

MSU	:	Mid-stream urine
NA	:	Nutrient agar
NCCLS	:	National Committee for Clinical Laboratory Standards
NLF	:	Non-lactose fermenting
NPHL	:	National Public Health Laboratory
PABA	:	Para-amino benzoic acid
PBP	:	Penicillin binding protein
PNSSP	:	Penicillin Non-Susceptible <i>Streptococcus pneumoniae</i>
RBC	:	Red Blood Cells
RNA	:	Ribonucleic Acid
rpm	:	revolution per minute
RS	:	Renal Stone
SIM	:	Sulphide Indole Motility
TMP/SMX	:	Trimethoprim-Sulphamethoxazole
TSI	:	Triple Sugar Iron
TUTH	:	Tribhuvan University Teaching Hospital
UK	:	United Kingdom
UPEC	:	Uropathogenic <i>Escherichia coli</i>
US	:	United States
UTI	:	Urinary Tract Infection
VP	:	Voges Proskauer
VRE	:	Vancomycin-resistant Enterococcus
VUR	:	Vesicoureteral Reflux
WBC	:	White Blood Cells
WHO	:	World Health Organization

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