



Phenotypic and genotypic studies on antimicrobial resistance of some urinary tract bacterial pathogens

A Thesis

Submitted in Partial Fulfillment of the
Requirements for

Master's degree

In Pharmaceutical Sciences
(Microbiology and Immunology)

By

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List of Abbreviations

AAC	Aminoglycoside acetylase
<i>aac(6')-Ib</i>	Gene coding for aminoglycoside 6'-N-acetyltransferase type Ib
<i>aac(6')-Ib-cr</i>	Gene coding for aminoglycoside 6'-N acetyltransferase type Ib - ciprofloxacin resistant variant
ABC	ATP-binding cassette transporter protein
AMC	Co-amoxiclav
AMP	Ampicillin
AMR	Antimicrobial resistance
ANT	Aminoglycoside nucleotide transferase
APH	Aminoglycoside phosphorylase
API	Analytical profile index
ASB	Asymptomatic bacteriuria
ATCC	American Type Culture Collection
AZM	Azithromycin
<i>bla_{CTX-M}</i>	Gene coding for CTX-M extended spectrum β -lactamase
<i>bla_{IMP}</i>	Gene coding for IMP carbapenemase
<i>bla_{KPC}</i>	Gene coding for KPC carbapenemase
<i>bla_{NDM}</i>	Gene coding for NDM carbapenemase
<i>bla_{OXA}</i>	Gene coding for OXA carbapenemase

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<i>bla</i>_{VIM}	Gene coding for VIM carbapenemase
<i>bla</i>_{SHV}	Gene coding for SHV extended spectrum β -lactamase
BLAST	Basic Local Alignment Search Tool
<i>bla</i>_{TEM}	Gene coding for TEM extended spectrum β -lactamase
bp	Base pair
CAZ	Ceftazidime
CCCP	Carbonyl cyanide m-chlorophenylhydrazone
CDC	Centers for Disease Control and Prevention
cfu	Colony forming unit
CIP	Ciprofloxacin
CLSI	Clinical and Laboratory Standards Institute
CN	Gentamicin
CoNS	Coagulase-negative staphylococci
CTX-M	CTX-M (active on CefoTaXime) extended spectrum β -lactamase enzyme
DA	Clindamycin
DDST	Double-disk synergy test
DHFR	Dihydrofolate reductase
DHPS	Dihydropteroate synthase
DNA	Deoxyribonucleic acid
DO	Doxycycline
E	Erythromycin

List of Abbreviations

ED	Emergency Department
EDTA	Ethylenediaminetetraacetic acid
EMB	Eosin methylene blue
<i>ere</i>	Gene coding for erythromycin esterase enzyme
Erm	Erythromycin ribosome methylase enzyme
<i>erm</i>	Gene coding for Erm enzyme
ESBL(s)	Extended spectrum β -lactamase(s)
FDA	Food and Drug Administration
FEP	Cefepime
FOX	Cefoxitin
GIT	Gastrointestinal tract
GNB	Gram-negative bacilli
GPC	Gram-positive cocci
HPF	High power field
IDSA	Infectious Diseases Society of America
IM	Intramuscular
IMP	Imipenem resistance carbapenemase enzyme
IPM	Imipenem
kbp	Kilo base pair
KPC	<i>Klebsiella pneumoniae</i> carbapenemase enzyme
LB	Luria Bertani
LEV	Levofloxacin

List of Abbreviations

MBL(s)	Metallo- β -lactamase(s)
MDR	Multidrug-resistant
MDRE	Multidrug-resistant <i>Enterobacteriaceae</i>
MEF	Macrolide efflux pump
<i>mef</i>	Gene coding for MEF efflux pump
MEM	Meropenem
MFS	Major facilitator superfamily efflux pumps
MHT	Modified Hodge test
MIC	Minimum inhibitory concentration
MLS	Macrolide lincosamide streptogramins B resistance
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
MRSE	Methicillin-resistant <i>Staphylococcus epidermidis</i>
NDM	New Delhi metallo- β -lactamase enzyme
NSAID(s)	Non-steroidal Anti-inflammatory Drug(s)
OmpF	Outer membrane protein F
OqxA	Multidrug efflux pump OqxA
<i>oqxA</i>	Gene coding for OqxA efflux pump
OqxB	Multidrug efflux pump OqxB
<i>oqxB</i>	Gene coding for OqxB efflux pump
ORF	Open reading frame
ori	Origin of replication
<i>otr</i>	Oxytetracycline resistance gene

List of Abbreviations

OXA	Oxacillinase enzyme
PABA	Para-aminobenzoic acid
PBP(s)	Penicillin binding protein(s)
PCR	Polymerase chain reaction
PMQR	Plasmid-mediated quinolone resistance
QepA	Quinolone efflux pump A
<i>qepA</i>	Gene coding for QepA efflux pump
Qnr	Quinolone resistance protein
<i>qnr</i>	Gene coding for Qnr protein
RND	Resistance-nodulation-cell division superfamily efflux pump
R.P.	Resistance profile
rpm	Round per minute
rRNA	Ribosomal ribonucleic acid
SAM	Ampicillin/sulbactam
SBL(s)	Serine β -lactamase(s)
SHV	Sulfhydryl variant extended spectrum β -lactamase enzyme
SMX	Sulfamethoxazole
SOB	Super optimal broth
SOC	Super optimal broth with catabolite repression
SXT	Co-trimoxazole
T_a	Annealing temperature
TAE	Tris-acetic acid-EDTA