

**COMPARATIVE ANTIBIOGRAM TYPING OF GRAM
NEGATIVE ISOLATES FROM HOSPITAL ENVIRONMENT
AND CLINICAL SAMPLES**

**A
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SUBMITTED TO THE CENTRAL DEPARTMENT OF
MICROBIOLOGY
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AWARD OF THE DEGREE OF
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(MEDICAL)**

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Abstract

Cross infection through hospital environment has been major challenge to control nosocomial infection. This has been worse with the emergence of multidrug resistant strains. The present study was conducted to correlate gram negative bacteria in hospital environment and clinical samples, to understand possibility of nosocomial infection.

The study was conducted for a period of six months during which gram negative isolates from 269 samples of hospital environment (air sample, surface swab and hand swab from healthcare workers) and 1110 clinical samples (urine, blood, pus, catheter tips, sputum etc) were identified by conventional microbiological method and antibiogram was performed by Kirby-Bauer disc diffusion method and NCCLS guidelines. Bacterial isolates obtained from both samples were tested for their relatedness based on their resistivity pattern among the tested antibiotics.

Of the total environmental samples 212 samples were found to be positive and total of 183 gram negative isolates were obtained and of the total clinical samples (1110) 159 isolates were obtained. Of the total gram negative isolates 84.2% (154/183) *Acinetobacter* spp., 8.2% (15/183) *E. coli*, 7.7% (14/183) *Klebsiella* spp. was isolated from environmental sample. And 3.1% (5/160) *Acinetobacter* spp., 67.5% (108/160) *E. coli*, 8.8% (14/160) *Klebsiella* spp. was isolated from clinical samples.

Analysis of MDR isolates revealed 70.8% (109/154) *Acinetobacter* spp. and 80.0% (4/5) in clinical isolates were found to be MDR. Similarly 86.6% (13/15) *E. coli* isolates isolated from environment sample and 61.1% (66/108) clinical isolates were found to be MDR. In case of *Klebsiella* spp. 100% (14/14) environmental isolates and 42.9 % (6/14) clinical isolates were found to be MDR. Antibiotyping showed single antibiogram type was identical in both the sample type in case of *Acinetobacter* spp. and *Klebsiella* spp. while such correlation was not established among the isolates of *E. coli* in both sample types.

Keywords: - Environment, clinical, gram negative, MDR, antibiogram typing, antibiogram type

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LIST OF ABBREVIATIONS

AST	-	Antibiotic Sensitivity Test
BA	-	Blood Agar
BHI	-	Brain Heart Infusion
BSI	-	Blood Stream Infections
CA	-	Chocolate Agar
CDC	-	Centres for Disease Control
CLSI	-	Clinical Laboratory Standard Institute
CoNS	-	Coagulase Negative Staphylococci
CRI	-	Catheter Related Infections
CSF	-	Cerebro Spinal Fluid
CSSD	-	Central Sterilize Supply Department
ESBL	-	Extended Spectrum β -Lactamase
FW	-	Female Ward
HCW	-	Health Care Worker
HICPAC	-	Hospital Infection Control Practices Advisory Committee
ICU	-	Intensive Care Unit
IDW	-	Infectious Disease Ward
MA	-	MacConkey Agar
MDR	-	Multi Drug Resistant
MHA	-	Muller Hinton Agar
MR	-	Methyl Red
MRSA	-	Methicillin Resistant <i>Staphylococcus aureus</i>
MSA	-	Mannitol Salt Agar
MSSA	-	Methicillin Sensitive <i>Staphylococcus aureus</i>
MSW	-	Male Surgical Ward
MW	-	Medical Ward
NA	-	Nutrient Agar
NB	-	Nutrient Broth

NI	-	Nosocomial infection
NINAS	-	National Institute of Neurological and Allied Sciences
NNISS	-	National Nosocomial Infection Surveillance system
OT	-	Operation Theater
OW	-	Orthopedic Ward
PCR	-	Polymerase Chain Reaction
PFGE	-	Pulse Field Gel Electrophoresis
POT	-	Post Operative Ward
SIM	-	Sulphide Indole Motility
TB	-	Tuberculosis
TPD	-	Tetramethyl p-Phenylene Diamine dihydrochloride
TSI	-	Triple Sugar Iron
UTI	-	Urinary Tract Infection
VP	-	Voges Proskauer
WHO	-	World Health Organization

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