

**ANTIBIOGRAM AND β -LACTAMASE PRODUCTION TEST OF
MULTIDRUG RESISTANT *STAPHYLOCOCCUS* SPECIES FROM
DIFFERENT CLINICAL SPECIMENS**

A

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Master of Science in Microbiology
(Medical)**

By

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ABSTRACT

The aim of this study is to isolate the multidrug resistant (MDR) staphylococci from various clinical specimens and test the β -lactamase enzyme in multidrug resistant staphylococci by chromogenic cephalosporin sticks. Total of 205 were isolated and identified as *Staphylococcus* spp. using standard microbiological technique. The isolates were classified as *S. aureus* and CONS based on slide and tube coagulase test. The percentage of *S. aureus* and CONS isolates were 67% and 33% respectively. Thus identified 98 (47.8%) staphylococci were screened as multidrug resistant by employing Kirby-Bauer disc diffusion method as recommended by Clinical Laboratory Standard Institute (CLSI 2006). On sensitivity assay of *S. aureus*, vancomycin and nitrofurantoin were 95.6% and 100% sensitive respectively. *S. aureus* were highly resistant to ampicillin (74.5%), nalidixic acid (74.2%) and oxacillin (61.7%). CONS were also highly sensitive to vancomycin and nitrofurantoin with 97.1% and 100% respectively. CONS were highly resistant to oxacillin (66.7%), cloxacillin (62.5%) and nalidixic acid (56.8%). Of the total *S. aureus* and CONS isolates 48.9% and 45.5% were multidrug resistant. Prevalence of MDR was found higher in male (51.1%) and age group 70-79 (66.7%). About 46.4% of OPD isolates were MDR. The multidrug resistant staphylococci on nitrocefin stick test revealed that 47% were β -lactamase producers. Among them 46.3% and 51.6% were *S. aureus* and CONS respectively. β -lactamase producers were highly resistant to ampicillin, cephalixin and nalidixic acid each with 93.8% resistance. On a comparative study of cloxacillin disc of various manufacturing companies, cloxacillin disc from HI-MEDIA, *S. aureus* and CONS showed 96% and 97.13% resistance respectively. However, for OXOID and MAST showed equal resistance of 56.25% and 61.7% respectively. Staphylococci isolated were highly sensitive to Nitrofurantoin and Vancomycin. β -lactamase positive staphylococci were highly resistant toward multiple of antibiotics. This suggests the need for the β -lactamase test prior to the antibiotic prescription.

Key words: *Staphylococcus* spp., Antibiotic resistance, Multidrug resistance, β -lactamase, Chromogenic cephalosporin stick test.

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LIST OF ABBREVIATION

AST	Antibiotic Sensitivity Test
BA	Blood Agar
BW	Burn Ward
CDC	Center for Disease Control and Prevention
CDM	Central Department of Microbiology
CLSI	Clinical and Laboratory Standard Institute
CONS	Coagulase Negative Staphylococci
DNA	Deoxyribonucleic Acid
ENT	Ear Nose Throat Ward
ESBL	Extended Spectrum β -lactamase
FMW	Female Medical Ward
FSW	Female Surgical Ward
ICU	Intensive Care Unit
MA	MacConkey Agar
MDR	Multidrug Resistant
MHA	Muller Hinton Agar
MIC	Minimum Inhibitory Concentration
MMW	Male Medical Ward
MRSA	Methicillin Resistant <i>S. aureus</i>
MSA	Mannitol Salt Agar
MSSA	Methicillin Sensitive <i>S. aureus</i>
MSW	Male Surgical Ward
MW	Molecular Weight
NA	Nutrient Agar
NB	Nutrient Broth
NS	Non Significant
NSICU	Neurosurgical Intensive Care Unit
NSTA	National Science and Technology Academy
NSW	Neuro Surgical Ward
OF	Oxidative Fermentative
OPD	Out Patient Department

ORSA	Oxacillin Resistant <i>S. aureus</i>
PBP	Penicillin Binding Protein
PCR	Polymerase Chain Reaction
POST-OP	Post Operation Ward
PRP	Penicillinase Resistant Penicillins
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
<i>S. epidermidis</i>	<i>Staphylococcus epidermidis</i>
<i>S. saprophyticus</i>	<i>Staphylococcus saprophyticus</i>
SPSS	Statistical Package for the Social Sciences
TU	Tribhuvan University
TUTH	Tribhuvan University Teaching Hospital
UK	United Kingdom
UTI	Urinary Tract Infection
VRSA	Vancomycin Resistant <i>S. aureus</i>
WHO	World Health Organization