

**METHICILLIN RESISTANT STAPHYLOCOCCUS
AUREUS FROM VARIOUS CLINICAL SAMPLES
COLLECTED IN BIR HOSPITAL**

A

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(Medical)

By

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RECOMMENDATION

This is to certify that **Mr. Krishna Kumar Raut** has completed this dissertation work entitled “**METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS FROM VARIOUS CLINICAL SAMPLES COLLECTED IN BIR HOSPITAL**” as a partial fulfillment of M. Sc. degree in Microbiology (Medical) under our supervision. The study was carried out in Microbiology Laboratory, Bir Hospital. To the best of our knowledge, this is an original research work and has not been submitted for any other degree.

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On the recommendation of **Dr. Dwij Raj Bhatta** and **Ms. Jyotsna Shrestha**, this dissertation work of **Mr. Krishna Kumar Raut**, entitled “**METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS FROM VARIOUS CLINICAL SAMPLES COLLECTED IN BIR HOSPITAL**”, a study carried out in Microbiology Laboratory, Bir Hospital”, has been approved for the examination and is submitted to Tribhuvan University in partial fulfillment of the requirements for M. Sc. degree in Microbiology (Medical).

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ABSTRACT

Staphylococcus aureus is an important and common cause of community-acquired as well as hospital-acquired infections. Moreover, methicillin resistant strains of *S. aureus*, usually being resistant to several antibiotics, are now presenting the major threat in many different countries throughout the world.

The aim of the present study is to determine the prevalence of infection caused by *S. aureus* as well as MRSA strains and to determine their antimicrobial susceptibility pattern.

In the study, total 744 pus samples collected during the period of November 2009 to March 2010 in Microbiology Laboratory of Bir Hospital. All the samples were analyzed by conventional culture method. Out of 744 clinical samples, a total of 125 *S. aureus* strains were isolated. Among 125 isolates, 64.8% (n=81) were from outpatients and 35.2% (n=44) were from admitted patients. Likewise, 53.6% (n=67) were from male patients and 46.4% (n=58) were from female patients. Overall, the highest percentage of *S. aureus* isolation (41.6%) was found in age group of below 10 years.

Antibiogram of all 125 *S. aureus* strains showed chloramphenicol (77.6%) was most effective drug, followed by oxacillin (71.2%), ciprofloxacin (67.2%), cloxacillin (64%), tetracyclin (62.4%), erythromycin (54.4%), amoxicillin (49.6%) and the least effective drug was found to be co-trimoxazole (44%). Prevalence of MRSA, using oxacillin disks, was found to be 28.8% (n=36) whereas, vancomycin was found to be 100% effective. Out of 36 MRSA strains, the maximum number of strains (n=25) were isolated from the outpatients. Similarly, in overall, the highest number of MRSA isolates (n=12) was found in the patients of age group 21-30 years.

High prevalence of staphylococcal infection and the infection due to MRSA in the hospital patients shows the need of regular surveillance. The study also shows the need of evaluation of antibiotic disks before the study in Nepal.

Key words: *S. aureus*, antibiogram, MRSA, oxacillin, Bir Hospital.

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LIST OF ABBREVIATIONS

µM	:	Micrometer
ATCC	:	American Type Culture Collection
CA-MRSA	:	Community Acquired-Methicillin Resistant <i>Staphylococcus aureus</i>
CDC	:	Centre for Disease Control
CFU	:	Colony Forming Unit
CLSI	:	Clinical Laboratory Standard Institute
CONS	:	Coagulase Negative Staphylococci
CVP tip	:	Central Venous Pressure tip
DNA	:	Deoxyribonucleic Acid
HAI	:	Hospital Acquired Infection
HA-MRSA	:	Hospital Acquired-Methicillin Resistant <i>Staphylococcus aureus</i>
MA	:	MacConkey Agar
MCG	:	Micro-gram
MDR	:	Multidrug Resistant
MIC	:	Minimum Inhibitory Concentration
MM	:	Millimeter
MRSA	:	Methicillin Resistant <i>Staphylococcus aureus</i>
MSA	:	Mannitol Salt Agar
NA	:	Nutrient Agar
NB	:	Nutrient Broth
NCCLS	:	National Committee for Clinical Laboratory Standard
O/F	:	Oxidative/Fermentative
OPD	:	Out Patient Department
ORSA	:	Oxacillin Resistant <i>Staphylococcus aureus</i>
PBPs	:	Penicillin Binding Proteins
TSST	:	Toxic Shock Syndrome Toxin

TUTH : Tribhuvan University Teaching Hospital
VISA : Vancomycin Intermediate *Staphylococcus aureus*
VRSA : Vancomycin Resistant *Staphylococcus aureus*
WHO : World Health Organization