BACTERIOLOGICAL PROFILE OF URINE OF POSTOPERATIVE PATIENTS UNDERGONE OPEN HEART SURGERY AT SHAHID GANGALAL NATIONAL HEART CENTRE, NEPAL

A

DISSERTATION

SUBMITTED TO THE CENTRAL DEPARTMENT OF MICROBIOLOGY

TRIBHUVAN UNIVERSITY

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE IN MICROBIOLOGY (MEDICAL)

BY

SUPRIYA SHARMA

CENTRAL DEPARTMENT OF MICROBIOLOGY

TRIBHUVAN UNIVERSITY

KIRTIPUR, KATHMANDU, NEPAL

2008

RECOMMENDATION

This is to certify that **Ms. Supriya Sharma** has completed this dissertation work entitled "**BACTERIOLOGICAL PROFILE OF URINE OF POSTOPERATIVE PATIENTS UNDERGONE OPEN HEART SURGERY AT SHAHID GANGALAL NATIONAL HEART CENTRE, NEPAL**" as a partial fulfillment for the degree of Master of Science in Microbiology under our supervision. To our knowledge, this thesis work has not been submitted for any other degree.

Dr. Dwij Raj Bhatta	**Prof. Dr. Bharat Mani Pokhrel**	**Dr. Bijoy Rajbanshi**
Associate Professor and Head	Head	Cardiovascular Thoracic Surgeon
Central Department of Microbiology,	Department of Clinical Microbiology,	Shahid Gangalal National
Tribhuvan University,	Institute of Medicine,	Heart Centre,
Kirtipur,	TUTH,	Bansbari,
Kathmandu, Nepal	Maharajgunj, Kathmandu, Nepal	Kathmandu, Nepal.

Date……..

CERTIFICATE OF APPROVAL

On the recommendation of **Dr. Dwij Raj Bhatta, Prof. Dr. Bharat Mani Pokhrel** and **Dr. Bijoy Rajbanshi,** this dissertation work by **Ms. Supriya Sharma** entitled **"BACTERIOLOGICAL PROFILE OF URINE OF POSTOPERATIVE PATIENTS UNDERGONE OPEN HEART SURGERY AT SHAHID GANGALAL NATIONAL HEART CENTRE, NEPAL"** has been approved for the examination and is submitted to the Tribhuvan University in partial fulfillment of the requirement for the degree of Master of Science in Microbiology.

_____

Dr. Dwij Raj Bhatta
Head of Department
Central Department of Microbiology
Tribhuvan University
Kirtipur, Kathmandu

Date:- .....

BOARD OF EXAMINERS

Recommended by:

Dr. Dwij Raj Bhatta (PhD in microbiology)
Supervisor

Prof. Dr. Bharat Mani Pokhrel (PhD, Post Doc Fulbright)
Supervisor

Dr. Bijoy Rajbanshi (CTS)
Supervisor

Approved by:

Dr. Dwij Raj Bhatta (PhD in microbiology)
Head of Department

Examined by:

Dr. Basista Prasad Rijal
Assistant Dean, Institute of Medicine, TUTH
External Examiner

Mr Komal Raj Rijal
Internal Examiner

Date: ……

ACKNOWLEDGEMENT

It gives me an immense pleasure to express my profuse gratitude and heartfelt appreciation to my supervisor, **Dr. Dwij Raj Bhatta**, Associate Professor and Head, Central Department of Microbiology, Tribhuvan University, Kirtipur, Kathmandu, Nepal for his constant inspiration and encouragement, tremendous support, constructive suggestion and guidance during the entire period of this research work. I am equally grateful to my supervisor, **Prof. Dr. Bharat Mani Pokhrel**, Professor and Head, Department of Clinical Microbiology, Institute of Medicine, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu Nepal for his inspiration and support. I would like to express my sincere gratefulness to my supervisor, **Dr. Bijoy Rajbanshi**, cardiac surgeon, Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal for his guidance and cooperation during sample collection.

I am equally indebted to **Dr. Bhagawan Koirala,** Executive Director, Shahid Gangalal National Heart Centre, Bansbari, Kathmandu, Nepal for his permission to utilize the laboratory facilities. I take this opportunity to thank all the staffs of Shahid Gangalal National Heart Centre for their kind help in various stages of my work.

I extend my thanks to **Mr. Dev Raj Joshi**, **Mr. Megha Raj Banjara**, **Ms. Shaila Basnyat, Mr. Komal Raj Rijal** and other lecturers and staffs of Central Department of Microbiology, Tribhuvan University for their constant inspiration and valuable guidance.

I wish to express my admiration and special thanks to all the friends, especially **Shailaja**, **Sulochana** and **Manita** for their support and encouragement.

My acknowledgement goes to my sisters **Suprina** and **Sulekha** for their help during computer work. Finally, I admire my **parents** for their moral support and attention in achieving the present academic position.

Date: ……

Supriya Sharma

ABSTRACT

Cardiac surgery is associated with high rate of postoperative complications including renal dysfunction. Persons with asymptomatic bacteriuria are at increased risk of developing symptomatic urinary tract infection and other complications. This study was performed in the laboratory of Shahid Gangalal National Heart Centre (SGNHC), Bansbari, from March to September, 2008 that included 151 midstream urine samples from postoperative patients who had undergone open heart surgery. The samples were processed for culture by semi quantitative standard loop method. Identification of the significant isolates was done by standard microbiological techniques and antibiotic susceptibility testing was done by Kirby Bauer disc diffusion method. The prevalence of significant bacteriuria was 11.92% among postoperative patients who had undergone open heart surgery. Out of 18 significant bacteriuric cases, 17 were asymptomatic. Females had higher percentage of significant bacteriuria than males, however, was statistically insignificant (p=0.22). Significant bacteriuria was higher among valve surgery cases 15.91% (14/88) followed by vascular surgery 10.52 % (2/19) and congenital 5.40% (2/37). The six different bacterial species isolated were *Escherichia coli* (44.44%), *Klebsiella pneumoniae* (16.67%), *Acinetobacter* spp. (11.11%), *Staphylococcus aureus* (11.11%), *Enterococcus* spp. (11.11%) and *Pseudomonas aeruginosa* (5.56%). All the gram negative isolates were sensitive to amikacin and most (92.31%) were resistant to ampicillin. All the gram positive isolates were sensitive to vancomycin and resistant to ampicillin, ciprofloxacin, cotrimoxazole, cloxacillin, cephalexin and erythromycin. Multidrug resistance (MDR) was 87.50 %(7/8) in *Escherichia coli* and 100% in *Klebsiella pneumoniae* (3/3), *Acinetobacter* spp. (2/2), *Pseudomonas aeruginosa* (1/1), *Staphylococcus aureus* (2/2) and *Enterococcus* spp. (2/2). A significant number of urinary isolates from postoperative cardiac patients were MDR which can result in unavoidable treatment failure. Therefore, the rationale use of antibiotics is suggested.

Keywords: Asymptomatic bacteriuria, Midstream urine, MDR strains, Postoperative patients

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ABU	Asymptomatic Bacteriuria
ATCC	American Type Culture Collection
BA	Blood Agar
cfu	Colony Forming Unit
CONS	Coagulase Negative Staphylococci
IDSA	Infectious Diseases Society of America
MA	MacConkey Agar
MDR	Multi-drug Resistant
MHA	Mueller Hinton Agar
ml	millilitre
MSU	Mid-Stream Urine
NCCLS	National Committee for Clinical Laboratory Standards
PAF	Prostatic Antibacterial Factor
PAP	Pyelonephritis-Associated Pili
SGNHC	Shahid Gangalal National Heart Centre
SIM	Sulfide Indole Motility
TSIA	Triple Sugar Iron Agar
TUTH	Tribhuvan University Teaching Hospital
UPEC	Uropathogenic *Escherichia coli*
UTI	Urinary Tract Infection
WBC	White Blood Cell