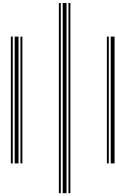


**URINARY TRACT INFECTION IN DIABETIC  
MICROALBUMINURIC PATIENTS VISITING  
B & B HOSPITAL.**

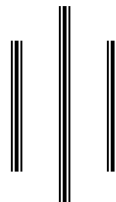


**A**

**Dissertation**

**Presented to the Central Department of Microbiology  
Tribhuvan University**

**In Partial Fulfillment of the Requirements for the Award of the Degree of  
Master of Science in Microbiology (Medical)**



**By**

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**Kirtipur, Kathmandu, Nepal  
2008**

## **RECOMMENDATION**

This is to certify that **Mr. Girdhari Rijal** has completed this dissertation work entitled “**URINARY TRACT INFECTION IN DIABETIC MICROALBUMINURIC PATIENTS VISITING B & B HOSPITAL**” as a partial fulfillment of M. Sc. Degree in Microbiology under our supervision. To our knowledge this thesis work has not been submitted for any other degree.

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# CERTIFICATE OF APPROVAL

On the recommendation of **Prof. Shyam Sundar Malla** and **Mr. Binod Lekhak** this dissertation work by **Mr. Girdhari Rijal**, entitled “**URINARY TRACT INFECTION IN DIABETIC MICROALBUMINURIC PATIENTS VISITING B & B HOSPITAL**” has been approved for the examination and is submitted to the Tribhuvan University in partial fulfillment of the requirement for M. Sc. Degree in Microbiology.

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**Girdhari Rijal**

## ABSTRACT

Diabetes is a heterogeneous group of diseases, characterized by a state of chronic hyperglycemia, resulting from a diversity of etiologies, environmentally and genetically or jointly. The underlying cause of diabetes is the defective production or action of insulin. Micro-albuminuria is a state of increase in urinary albumin too subtle to be measured by ordinary chemical procedures. Preceding Micro-albuminuria is highly predictive of diabetic nephropathy and end-stage of renal disease. Urinary tract infections (UTI) are commonly encountered in patients with diabetic microalbuminuria as asymptomatic bacteriuria (ASB) which can lead to serious infection. Infections of the urinary tract are the second most common type of infection in the body.

The present study was conducted in B & B hospital among visiting Patients suspected of Urinary Tract Infection (UTI) who had been diagnosed as diabetic micro-albuminuric Patients (cases) and non-diabetic non-micro-albuminuric patients (controls) who visited during April 10, 2007 to August 20, 2007. The aim of research was to study the prevalence of UTI in diabetic micro-albuminuric patients.

Altogether, 300 samples (both blood and urine) were collected, 150 were screened for diabetic micro-albuminuric samples and 150 were screened for non-diabetic non-microalbuminuric samples (controls). Out of 150 diabetic micro-albuminuric samples, 77(51.4%) showed significant growth and out of 77, 49(63.7%) were Multiple Drug Resistant (MDR) strains. Similarly, out of 150 non-diabetic non-microalbuminuric samples, 38(33.0%) showed significant growth and out of 38, 22(57.9%) were MDR-strains. Nine different bacteria were isolated, among them *Escherichia coli* was found to be the most predominant isolate from cases and controls. Out of 77, 42(54.5%) were *E. coli* isolates, and out of 42, 33 (68.8%) were MDR-strains. The predominant gram positive organism isolated was *Staphylococcus aureus* (N=2) and both were MDR strains. Most of the organisms isolated from diabetic microalbuminuric patients were susceptible to Imipenem and Meropenem and almost all gram negative organisms isolated from non-diabetic non-microalbuminuric patients were susceptible to Nitrofurantoin whereas, Gram positive isolates were sensitive to tetracycline.

Diabetic microalbuminuria showed the significant association with the urine culture positivity ( $p < 0.05$ ) as increase in concentration of urine microalbumin from 2.1 mg/dl to 20.0 mg/dl, there was the increase in growth positive as same as there is significant association between culture positivity and gender ( $p > 0.05$ ). Higher proportion of significant growth seen as the level of urinary micro-albumin increases was found statistically significant ( $p < 0.05$ ) but there is no significant association between types of diabetic patient and UTI ( $p > 0.05$ ). The sensitivity and specificity of urine culture test on the basis of level of urinary sugar and micro-albumin to diagnose UTI were found 67% and 60.5% respectively.

**Key Words:** Urinary tract infection, Diabetic microalbuminuria, Multi-drug resistance

# TABLE OF CONTENTS

	PAGE No.
TITLE PAGE	i
RECOMMENDATION	ii
CERTIFICATE FOR APPROVAL	iii
BOARD OF EXAMINERS	iv
ACKNOWLEDGEMENT	v
ABSTRACT	vi
TABLE OF CONTENTS	vii
LIST OF ABBREVIATIONS	x
LIST FO TABLES	xi
LIST OF FIGURES	xii
LIST OF PHOTOGRAPHS	xiii
LIST OF APPENDICES	xiv
<b>CHAPTER I: INTRODUCTION</b>	1-4
<b>CHPATER II: OBJECIVES</b>	5
<b>CHAPTER III: LITERATURE REVIEW</b>	
3.1    GLUCOSE HOMEOSTASIS	6
3.2    DAIBETES	6
3.2.1    CLASSIFICATION OF DIABETES	7-8
3.2.2    ETIOLOGY OF DIABETES MELLITUS	8-9
3.2.3    RISK FACTORS OF DIABETES MELLITUS	9
3.2.4    DIAGNOSTIC CRITERIA FOR DIABETES MELLITUS	10-11
3.2.5    COMPLICATIONS ASSOCIATED WITH DIABETES MELLITUS	11
3.2.6    FREQUENTLY ENCOUNTERED INFECTIONS IN DIABETES	12
3.3    MICROALBUMINURIA	13
3.3.1    ETIOLOGY OF MICROALBUMINURIA	13
3.3.2    DIAGNOSTIC CRITERIA FOR MICROALBUMINURIA	14
3.3.3    COMPLICATIONS ASSOCIATED WITH MICROALBUMINURI	15
3.3.4    MICROALBUMINURIA IN DIABETES	15
3.4    URINARY TRACT INFECTION	16
3.4.1    CLASSIFICATION OF URINARY TRACT INFECTION	17-19

3.4.2 RISK FACTORS FOR THE DEVELOPMENT OF UTI	20
3.5 PATHOGENESIS	21-23
3.6 DIAGNOSIS OF URINARY TRACT INFECTION	23-28
3.7 DIAGNOSTIC CRITERIA FOR URINARY TRACT INFECTION	28-30
3.8 ETIOLOGICAL AGENTS OF URINARY TRACT INFECTION	30
3.9 MICROBIOLOGY OF UTI IN DIABETIC MICROALBUMINURIC PATIENT	31

## **CHAPTER IV: MATERIALS AND METHODS**

4.1 MATERIALS	33
4.2 METHODOLOGY	33
A. BLOOD SAMPLE COLLECTION AND SUGAR DETERMINATION	33-35
B. URINE SAMPLE COLLECTION, TRANSPORT AND ANALYSIS	
1. MACROSCOPIC EXAMINATION	35
2. CHEMICAL EXAMINATION	
a. URINE SUGAR AND ALBUMIN DETECTION	35
b. ACETONE DETECTION IN URINE	36
c. MICROALBUMIN DETECTION IN URINE	36-37
3. MICROSCOPIC EXAMINATION	37
C. CULTURE OF SPECIMEN	
i. IDENTIFICATION OF THE ISOLATES	38
ii. ANTIBIOTIC SUSCEPTIBILITY TESTING	39
iii. PURITY PLATE	

## **CHAPTER V: RESULTS**

5.1 PATTERN OF BLOOD SUGAR LEVEL IN PATIENTS OF DIFFERENT AGE GROUP	40
5.2 PATTERN OF MICROALBUMIN IN URINE OF PATIENTS OF DIFFERENT AGE GROUP	41
5.3 PATTERN OF MICROALBUMIN IN GENDER	42
5.4 CATEGORIZATION OF DIABETES INTO TYPE 1 AND TYPE 2 ON THE BASIS OF ACETONE TEST IN URINE SAMPLE	42
5.5 PATTERN OF PATIENTS REQUESTING FOR URINE SAMPLE	43
5.5.1 SIGNIFICANT GROWTH OF PATHOGENS FROM URINE SAMPLES OF REQUESTING PATIENTS	
5.5.2 GROWTH PATTERN OF BACTERIA IN URINE SAMPLE	44
5.5.3 PATTERN OF GENDER AND SIGNIFICANT BACTERIAL GROWTH FROM TYPES OF DIABETES PATIENTS	
5.5.4 CORRELATION OF DIABETES WITH MICROALBUMINURIA AND SIGNIFICANT GROWTH	45-46
5.5.5 PATTERN OF SIGNIFICANT BACTERIAL GROWTH ACCORDING TO GRAM'S STAIN	46
5.5.6 PATTERN OF MICROBIAL ISOLATES FROM URINE SAMPLE	46-47
5.5.7 ANTIBIOTIC SUSCEPTIBILITY PATTERN OF GRAM NEGATIVE BACTERIA ISOLATED FROM DIABETES MICROALBUMINURIC PATIENTS	47
5.5.8 ANTIBIOTIC SUSCEPTIBILITY PATTERN OF GRAM POSITIVE BACTERIA ISOLATED FROM UTI PATIENTS	



5.5.9	ANTIBIOTIC SUSCEPTIBILITY PATTERN OF GRAM NEGATIVE BACTERIA ISOLATED FROM NON-DIABETIC NON-MICROALBUMINURIC PATIENTS	49
5.6	ANTIBIOTIC SUSCEPTIBILITY PATTERN OF E.COLI ISOLATED FROM URINE SAMPLE	49
5.6.1	ANTIBIOTIC SUSCEPTIBILITY PATTERN OF S.AUREUS FROM URINE SAMPLE	50
5.6.2	PATTERN OF MDR PATHOGENES IN DIABETIC MICROALBUMINURIC AND NON DIABETIC NON MICROALBMINURIC PATIENTS	
5.6.3	STATISTICAL PATTERN OF THE RESULTS	51
<b>CHAPTER VI: DISCUSSION AND CONCLUSION</b>		<b>56-61</b>
6.1	DISCUSSION	
6.2	CONCLUSION	
<b>CHAPTER VII: SUMMARY AND RECOMMENDATIONS</b>		<b>62-63</b>
7.1	SUMMARY	
7.2	RECOMMENDATIONS	
<b>CHAPTER VIII: REFERENCES</b>		
<b>CHAPTER IX: APPENDICES I–VII</b>		

## LIST OF ABBREVIATIONS

ADA	American Diabetes Association
ASB	Asymptomatic Bacteriuria
ATCC	American Type Culture Collection
BA	Blood Agar
CA	Chocolate Agar
CFU	Colony Forming Units
CONS	Coagulase Negative Staphylococci
CRF	Coagulase Reacting Factor
DHFR	Dihydrofolate Reductase
DNA	Deoxyribonucleic Acid
ESBL	Extended Spectrum of Beta Lactamase
ICU	Intensive Care Unit
IS	Insertion Sequence
MA	MacConkey Agar
MBC	Minimum Bactericidal Concentration
MDR	Multi-drug Resistant
MHA	Mueller Hinton Agar
MIC	Minimum Inhibitory Concentration
MLS	Macrolide-Lincosamide-Streptogramin
MRSA	Methicillin Resistant <i>Staphylococcus aureus</i>
MRVP	Methyl Red Voges Proskauer
NA	Nutrient Agar
NB	Nutrient Broth
NCCLS	National Committee for Clinical Laboratory Standards
NCTC	National Collection of Type Cultures
PBP	Penicillin Binding Protein
QREC	Quinolone Resistant <i>Escherichia coli</i>
RNA	Ribonucleic Acid
SIM	Sulfide Indole Motility
TSIA	Triple Sugar Iron Agar
UTI	Urinary Tract Infection

# LIST OF TABLES

- Table 1: Clinical classification of diabetes mellitus
- Table 2: Diagnostic values for the oral glucose tolerance test
- Table 3: Definition of micro-albuminuria
- Table 4: Definition of abnormalities in albumin excretion
- Table 5: Classification of UTI
- Table 6: Possible risk factors in the development of UTI
- Table 7: Recommendations for reporting UTI
- Table 8: Possible pathogens in urine sample
- Table 9: Procedure for glucose estimation in blood
- Table 10: Procedure for microalbumin determination in urine
- Table 11: Pattern of blood sugar level in patients of different age group
- Table 12: Pattern of urine microalbumin level in patients of different age group
- Table 13: Pattern of Pattern of microalbumin in gender
- Table 14: Categorization of diabetes mellitus into type 1 and type 2 on the basis of acetone test in urine sample and its pattern on gender
- Table 15: Pattern of patient requesting for urine sample
- Table 16: Significant growths of pathogens from urine sample
- Table 17: Growth pattern of bacteria in urine sample
- Table 18: Pattern of gender and significant bacterial growth from types of diabetes patients
- Table 19: Correlation of diabetes with microalbuminuria and significant growth
- Table 20: Pattern of significant bacterial growth according to gram's stain
- Table 21: Pattern of microbial isolates from urine sample
- Table 22: Antibiotic susceptibility pattern of gram negative bacteria isolated from diabetic microalbuminuric patients
- Table 23: Antibiotic susceptibility pattern of gram positive bacteria isolated from UTI
- Table 24: Antibiotic susceptibility pattern of gram negative bacteria isolated from non-diabetic non-microalbuminuric patients
- Table 25: Antibiotic susceptibility pattern of E.coli isolated from urine sample
- Table 26: Antibiotic susceptibility pattern of S.aureus isolated from urine sample
- Table 27: Patter of MDR pathogens in diabetes microalbuminuric and non-diabetes non-microalbuminuric patients

## **LIST OF FIGURES**

- Figure 1: Flow diagram for processing urine sample
- Figure 2: Pattern of patients requesting for urine culture
- Figure 3: Age wise distribution of patients requesting for urine culture
- Figure 4: Growth pattern bacteria in urine sample
- Figure 5: Pattern of significant growth from different types of diabetic patients
- Figure 6: Pattern of significant bacterial growth from different micro-albumin level
- Figure 7: Pattern of significant bacterial growth according to Gram stain
- Figure 8: Percentage distribution of isolates from the urine sample
- Figure 9: Antibiotic sensitivity pattern of Gram negative isolates from diabetic micro-albuminuric patients
- Figure 10: Antibiotic sensitivity pattern of Gram positive isolates from UTI patients
- Figure 11: Pattern of MDR strains among total isolates from urine sample

## LIST OF PHOTOGRAPHS

- Photograph 1 Antibiotic susceptibility test of *Escherichia coli* showing inhibition zones on Mueller-Hinton agar
- Photograph 2 Multi-drug resistant Gram negative isolate (*Escherichia coli*) on Mueller-Hinton agar
- Photograph 3 Biochemical tests for *Escherichia coli*
- Photograph 4 Researcher performing work at lab

# LIST OF APPENDICES

**APPENDIX-I:** Questionnaire

**APPENDIX-II:**

- I. Composition and Preparation of Different Culture Media
- II. Biochemical Test Media
- III. Staining and Test Reagents

**APPENDIX-III:** Gram Staining Procedure

**APPENDIX-IV:**

1. Biochemical Tests For Identification of Bacteria

**APPENDIX-V:** List of Equipments and Materials Used During the Study

**APPENDIX-VI:** Chi-square and other tests

**APPENDIX-VII:** Distinguishing reactions of the commoner and pathogenic Enterobacteriaceae

**APPENDIX-VIII:** Zone Size Interpretative Chart