



**STUDY OF THE PATTERN OF
VARIABLE FORMS
OF TUBERCULOSIS IN FAYOUM CHEST
HOSPITAL IN THE PERIOD FROM
JUNE 2006 - JUNE 2009**

Thesis

*Submitted for partial fulfillment of The master degree in
Chest diseases and tuberculosis*

By

Abd EL Rahmman Mostafa Ahmed
M.B.B.CH.

Supervised by

Prof. Yasser Mostafa Mohammed

Professor of chest diseases,
Ain shams university

Dr. Nehad Mohammed Osman

Lecture of chest Diseases,
Ain shams university

**Faculty of medicine
Ain shams university**

2010

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

”وقل ربی زدنی علماً“

صدق الله العظيم

سورة طه الآية 114

ACKNOWLEDGMENT

*Firstly, thanks to **ALLAH**, who enabled me to carry out this work, and every work.*

*My deep and sincere gratitude to Professor **Yasser Mostafa Mohammed**, professor of Pulmonology, Ain-Shams University. His advices support and encouragement has been invaluable throughout the work. He continuously followed my work and pushed me forward. To him, all my appreciation.*

*I am indebted to Doctor **Nehad Mohammed Osman**, Lecture of Pulmonology, Ain-Shams University. She has continuously revised and evaluated my work with a combination of scientific advices and encouraging words. She has been hand in hand with me throughout all phases of this work.*

Great appreciation and gratitude to all my professors and colleagues in chest diseases department, Ain shams University.

CONTENTS

	Page No.
List of Figures	II
List of Table	IV
List of Abbreviations	VI
INTRODUCTION	1
AIM OF THE WORK	3
REVIEW OF LITERATURE	4
Evolution Of Tuberculosis	4
Prevalance of T.B	15
Pathogenesis	22
Pathology	25
Diagnosis	32
Case definition	49
B.C.G. vaccine	54
Treatment	57
First-line anti T.B drugs	57
Second-line anti T.B drugs	75
Recommended treatment regimens	87
New antituberculosis drugs	90
Mdr tuberculosis	94
Xdr tuberculosis	97
Dots	101
PATIENTS AND METHODS	103
RESULTS	106
DISCUSSION	122
SUMMARY AND CONCLUSION	136
RECOMMENDATIONS	139
REFERENCES	140
ARABIC SUMMARY	-

LIST OF FIGURES

Figure No.	Title	Page No.
1	Classification of tuberculous cases according to the age of the patients in the studied group.	106
2	Classification of tuberculous cases according to the gender of the patients in the studied group.	107
3	Classification of tuberculous cases according to the occupation of the patients in the studied group.	108
4	Classification of tuberculous patients according to the site of lesion in the period of study.	109
5	Classification of extra-pulmonary tuberculous cases in the studied group.	110
6	Classification of patients with pulmonary tuberculosis according to direct smear examination in the period of study.	111
7	Classification of patients with pulmonary tuberculosis according to sputum culture for acid-fast bacilli in the period of the study.	112
8	Distribution of bronchogenic tuberculosis according to extent of lesion based on radiological findings in the studied group.	113
9	The number and percentage of newly diagnosed and retreated tuberculous patients in the period of study.	114

10	Classification of tuberculous cases according to their	115
	reference in the period of the study.	
11	Classification of tuberculous cases according to their	116
	reference in the period of the study.	
12	Classification of tuberculous cases according to the outcome	117
	of treatment.	
13	Major complications affecting the studied tuberculous cases	118
	during the years of study.	
14	Results of sputum examination by direct smear on discharge	119
	of patients with pulmonary tuberculosis.	
15	Classification of tuberculous patient according to regimen of	120
	treatment.	
16	Classification of tuberculous patient according to their	121
	residence in Fayoum cities.	

LIST OF TABLE

Table No.	Title	Page No.
1	Case Detection of Egypt 2008.	16
2	Treatment Outcome of Egypt 2007.	16
3	Estimated epidemiological burden of TB in Egypt (1990-2008).	17
4	Clinical presentation of tuberculosis.	33
5	Classification of tuberculous cases according to the age of the patients in the studied group.	106
6	Classification of tuberculous cases according to the gender of the patients in the studied group.	107
7	Classification of tuberculous cases according to the occupation of the patients in the studied group.	108
8	Classification of tuberculous patients according to the site of lesion in the period of study.	109
9	Classification of extra-pulmonary tuberculous cases in the studied group.	110
10	Classification of patients with pulmonary tuberculosis according to direct smear examination in the period of study.	111
11	Classification of patients with pulmonary tuberculosis according to sputum culture for acid-fast bacilli in the period of the study.	112

12	Distribution of bronchogenic tuberculosis according to extent of lesion based on radiological findings in the studied group.	113
13	The number and percentage of newly diagnosed and retreated tuberculous patients in the period of study.	114
14	The main presenting symptoms of studied group.	115
15	Classification of tuberculous cases according to their reference in the period of the study.	116
16	Classification of tuberculous cases according to the outcome of treatment.	117
17	Major complications affecting the studied tuberculous cases during the years of study.	118
18	Results of sputum examination by direct smear on discharge of patients with pulmonary tuberculosis.	119
19	Classification of tuberculous patient according to regimen of treatment.	120
20	Classification of tuberculous patient according to their residence in Fayoum cities.	121

LIST OF ABBREVIATIONS

ADA	: Adenosine deaminase
AFB	: Acid-Fast Bacilli.
ARTI	: Annual Risk of Tuberculosis Infection.
ATS	: American Thorathic Society.
BCG	: Bacillus Calmette Guerin.
CDC	: Centers for Disease Control.
CFP-10	: Culture filtrate protein 10
DNA	: Deoxyribonucleic acid.
DOTS	: Directly Observed Therapy with Standardized Regimens.
ELISA	: Enzyme linked immunosorbent assay.
ELISPOT	: Enzyme-linked immunospot assay
EMB	: Ethambutol
ESAT-6	: Early secretory antigen target 6
GCT	: Governorate coordinator for Tuberculosis
HIO	: Health insurance organization
HIV	: Human Immunodeficiency Virus.
IGRAs	: Interferon-gamma release assays
INH	: Isonicotinic Acid Hydrazide.
IUATLD	: International Union against TB and Lung Disease.
LJ	: Löwenstein-Jensen
LSPS	: large sequence polymorphisms
LTBI	: Latent tuberculosis infection

M.TB	: Mycobacterium Tuberculosis.
MDR TB	: Multi-Drug Resistance Tuberculosis.
MGIT	: Mycobacterium Growth Indicator Tube.
MOHP	: Ministry Of Health and Population.
MTD	: Mycobacterium tuberculosis direct test
NAAT	: Nucleic acid amplification tests
NIAID	: National Institute of Allergy and Infectious Diseases
No.	: Number
NTP	: National TB Program.
PAS	: P-Aminosalicylic acid
PCR	: Polymerase Chain Reaction.
PHC	: Primary health care.
PZA	: Pyrazinamide
RIF	: Rifampin
SM	: Streptomycin
SNPS	: single nucleotide polymorphisms
TB	: Tuberculosis.
Th cells	: T-helper cells.
WHO	: World Health Organization.
XDR TB	: Xtensively-drug resistant tuberculosis
ZN	: Ziehl-Neelson.

INTRODUCTION

Tuberculosis is a disease caused by bacteria belonging to *Mycobacterium tuberculosis* complex. The disease usually affects the lungs, although in up to one third of cases, other organs are involved. Tuberculosis is the main cause of infection related mortality in the world. It has increased in majority of countries not only due to its association with HIV, but also due to other conditions such as poverty, migration, addiction, homeless or inadequacy of health care resources. **(Alcaide et al; 1996).**

Tuberculosis is considered as the most important medical problem in Egypt after Bilharziasis. In spite of Ministry of health and population (MOHP) efforts to face TB in past years, it is still a big problem which necessitates more efforts. **(MOHP; 1996).**

Someone in the world is newly infected with TB bacilli every second and one-third of the world's population is currently infected with TB **(WHO; 2006)**. Only about 10 percent of these people will develop TB disease in their lifetime. The other 90 percent will never get sick from the TB germs or be able to spread them to other people. TB is an increasing and major world wide problem, especially in Africa where the spread has been facilitated by AIDS. It is estimated that nearly 1 billion people will become newly infected, over 150 million will become sick, and 36 million

will die worldwide between now and 2020 – if control is not strengthened further. Each year there are more than 8.8 million cases and close to 1.6 million deaths attributed to TB. (**WHO; 2007**).

AIM OF THE WORK

The aim of the present work is to study the variable forms of tuberculous cases in the chest hospital in Fayoum governorate in the period from June 2006 to June 2009.

EVOLUTION OF TUBERCULOSIS

Tuberculosis has co-evolved with humans for many thousands of years, and perhaps as much as several million years, but the oldest human remains showing signs of tuberculosis infection are 9,000 years old. During this evolution, *M. tuberculosis* has lost numerous coding and non-coding regions in its genome, losses that can be used to distinguish between strains of the bacteria. The implication is that *M. tuberculosis* strains differ geographically, so their genetic differences can be used to track the origins and movement of each strain **(Rao et al: 2005)**.

It is a simple and well-known fact that many, probably the majority of us, harbour in our bodies the living infectious agent, the tubercle bacillus, i.e., are infected, but do not develop pathological signs. We live our normal life, yet as bearers of viable tubercle bacilli we might develop disease at any moment; we are infected, yet we do not suffer from infectious disease; some of us are predisposed to succumb to tuberculosis, some of us are resistant.

The primary complex, Disseminated or generalised tuberculosis and Isolated pulmonary or bronchogenic tuberculosis are the fundamental types in which tuberculosis appears in man. These 3 fundamental types of tuberculosis may occur in man independent