DETERMINATION OF THE TOTAL NUMBER OF EXTRAPULMONARY TUBERCULOSIS AND ITS PERCENTAGE IN RELATION TO PULMONARY TUBERCULOSIS DURING THE LAST 5 YEARS IN IMBABA CHEST HOSPITAL

Thesis

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Mostafa M. Galal
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LIST OF ABBREVIATIONS

ADA:	Adenosine Deaminase
AFB:	Acid Fast Bacilli
AIDS:	Acquired Immuno-Deficiency -Syndrome
AS:	Ammonium Sulfate
ATS:	American Thoracic Society
BCG:	Basili Callmet and Guerine
CDC:	Closed Direct Contact
CMI:	Cell Mediated Immunity
CSF:	Cerebro-Spinal Fluid
DNA:	Double-Stranded Nucleic Acid
DOT:	Direct Observed Therapy
DTH:	Delayed Type Hypersensitivity
EDITA:	Ethylene Diamine Tetra Acetic acid
EPTB:	Extrapulmonary Tuberculosis
ESP:	Extra Sensing Power
HEPA:	High Efficiency Particulate Air
HPLC:	High Performance Liquid Chromatography
IFN:	Interferon
IL-1:	Interleukin-1
INH:	Isoniazides
LAM:	Lipo-Arabino-Mannan(steps necrotics)
MDRTB:	Multi Drug Resistance
MGIT:	Mycobacterial growth indicator
MHC:	Major Histo Compatiblity Complex
MIC:	Minimal Inhibitory Concentration
MTB:	Mycobacterial Tuberculosis
NTM:	Non-Tuberculous Mycobacterium
PCR:	Polymerase Chain Reaction
PPD:	Purified Protein Derivative
PRA:	Polymerase Chain Reaction Restriction Analysis
RNA:	Ribosomal Nucleic Acid
TB:	Tuberculosis
TNF:	Tumour Necrosis Factor
WHO:	World Health Organization
Z-N:	Zehil-Nelsen Stain

ABSTRACT

T.B is still one of the prevalence disease which affect human health new cases calculated as 8-10 million cases, and number of deaths as 3 million deaths annually. In our study, we compare between the pulmonary tuberculosis and extrapulmonary tuberculosis through do statistics between patients with pulmonary tuberculosis and patients with extrapulmonary tuberculosis in last five years in T.B Archieve of Imbaba Chest Hospital. The pulmonary tuberculosis diagnosed by: (1) Positive history by presence of chronic cough more than one month and general symptoms of tuberculosis. (2) Positive chest x-ray, finding. (3) Positive sputum smear for AFB (in cases of positive sputum pulmonary tuberculosis). (4) Positive tuberculin skin test. The extrapulmonary tuberculosis diagnosed by: (1) Highly positivity of tuberculin test >15 mm. (2) Biopsies taken from diseased part either pleura or lymph node pathology examination and tuberculin skin test have an important role in diagnosis of tuberculosis especially extrapulmonary tuberculosis.

The duration of therapy between 6 month and 9 month and 6 month therapy more in extrapulmonary tuberculosis in pulmonary tuberculosis, the therapy between 6 month to 9 month and the result either relapse, cure, resistance, default. Conclusion: Pulmonary T.B was the most common form of T.B, and in extrapulmonary T.B, the pleural effusion and T.B lymphadenitis are the most common forms of extrapulmonary T.B.

Keywords:

Pulmonary tuberculosis
Extrapulmonary tuberculosis
Positive sputum
Negative sputum

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INTRODUCTION

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Tuberculosis (abbreviated as TB for Tubercle Bacillus) is a common and deadly infectious disease caused by the *Mycobacterium tuberculosis* or *Mycobacterium bovis*, which mostly affects the lungs (pulmonary TB) but can also affect the central nervous system, lymphatic system, circulatory system, genitourinary system, bones, joints, and even the skin.

Over one-third of the world's population now has the TB bacterium in their bodies and new infections are occurring at a rate of one per second **(World Health Organization, 2006)**. Not everyone who is infected develops the disease and asymptomatic latent TB infection is most common. However, one in ten latent infections will progress to active TB disease which, if left untreated, will kill more than half of its victims. In 2004, 14.6 million people had active TB and there were 8.9 million new cases and 1.7 million deaths **(World Health Organization, 2006)**, mostly in developing countries. A rising number of people in the developed world contract tuberculosis because their immune systems are compromised by immunosuppressive drugs, substance abuse, or HIV/AIDS.

The rise in HIV infection levels and the neglect of TB control programs have caused a resurgence of tuberculosis. Drug-resistant strains of TB have emerged and are spreading (in 2000-2004, 20% of cases were resistant to standard treatments, and 2% were also resistant to second line drugs) **(Centers for Disease Control, 2006)**. Promoted by WHO, the DOTS (Directly Observed Treatment or Directly Observed Therapy) strategy appears to be the primary factor explaining the differences in TB incidence rates cross-nationally (even after considering socio-economic factors) **(WHO, 2006)**, yet almost nothing is known ethnographically about the effectiveness of

implementing anti-poverty programs in conjunction with the application of the DOTS TB control strategy program in regions of high TB and MDRTB incidence (resistant to "first line" drugs, isoniazid and rifampicin), such as in the case of Peru or Bolivia. The World Health Organization declared TB a global health emergency in 1993, and the Stop TB Partnership proposed a Global Plan to Stop Tuberculosis which aims to save 14 million lives between 2006 and 2015 **(Tuberculosis, 1911)**.

In the past, tuberculosis was called consumption, because it seemed to consume people from within, with a bloody cough, fever, pallor, and long relentless wasting. Other names included phthisis (Greek for consumption) and phthisis pulmonalis; scrofula, (in adults), affecting the lymphatic system and resulting in swollen neck glands; tabes mesenterica, TB of the abdomen and lupus vulgaris, TB of the skin; wasting disease; white plague, because sufferers appear markedly pale; king's evil, because it was believed that a king's touch would heal scrofula; and Pott's disease, or Gibbus of the spine and joints **(Rudy's List of Archaic Medical Terms, 2006; NID, 2006)**. Miliary TB is an archaic term that is still occasionally used, when the infection invades the circulatory system resulting in X-ray lesions with the appearance of millet seeds **(Rudy's List of Archaic Medical Terms, 2006; CDC, 2003)**. This form of TB is now more commonly named disseminated TB.

The cause of tuberculosis, Mycobacterium tuberculosis (MTB), is a slow-growing aerobic bacterium that divides every 16 to 20 hours; this is extremely slow compared to other bacteria that have division times measured in minutes **(Madison, 2001)**. In contrast, one of the fastest growing bacteria is a strain of E. coli that can divide roughly every 20 minutes. As MTB only has one phospholipid outer membrane, it is classified as a Gram-positive bacteria. However, if a

Gram stain is performed, MTB either stains very weakly Gram-positive, or does not retain dye, due to the high lipid content of its cell wall **(Parish and Stoker, 1999)**. MTB is a small rod-like bacillus which can withstand weak disinfectants and can survive in a state for weeks. Normally, the bacteria can only grow within a host organism, so in vitro smear of M. tuberculosis took a long time to develop, but is now a routine laboratory procedure **(Madison, 2001)**.

MTB is identified microscopically by its staining characteristics: it retains certain stains after being treated with acidic solution, and is thus classified as an "acid-fast bacillus" or AFB **(Parish and Stoker, 1999)**. In the most common staining technique, the Ziehl-Neelsen stain, AFB are stained a bright red which stands out clearly against a blue background. Acid-fast bacilli can also be visualized by fluorescent microscopy, and by an auramine-rhodamine stain.

The M tuberculosis complex includes 3 other mycobacteria which can cause tuberculosis: M. bovis, M. africanum and M. microti. The first two are very rare causes of disease in immunocompetent people, and M. microti is not usually pathogenic, although it is possible that the prevalence of M. microti infections has been underestimated) **(Niemann et al., 2000)**. Other pathogenic mycobacteria are known, such as Mycobacterium leprae, Mycobacterium avium and M. kansasii. The last two are part of the group defined as Non-tuberculous mycobacteria (NTM). Nontuberculous mycobacteria are mycobacteria that are not part of the M. tuberculosis complex, and do not cause leprosy, but do cause pulmonary diseases resembling tuberculosis **(ATS, 1997)**.

Mycobacterium tuberculosis is the etiologic agent of tuberculosis in humans. Humans are the only reservoir for the bacterium.

Mycobacterium bovis is the etiologic agent of TB in cows and rarely in humans. Both cows and humans can serve as reservoirs. Humans can also be infected by the consumption of unpasteurized milk. This route of transmission can lead to the development of extra-pulmonary TB, exemplified in history by bone infections that led to hunched backs.

Other human pathogens belonging to the Mycobacteriurn genus include Mycobacterium avium which causes a TB-like disease especially prevalent in AIDS patients, and Mycobacterium leprae, the causative agent of leprosy.

TB infection means that M. TB is in the body but the immune system is keeping the bacteria under control. The immune system does this by producing macrophages that surround the tubercle bacilli. The cells form a hard shell that keeps the bacilli contained and under control. Most people with TB infection have a positive reaction to the tuberculin skin test. People who have TB infection but not TB disease are NOT infectious, i.e. they cannot spread the infection to other people. These people usually have a normal chest x-ray. TB infection is not considered a case of TB. Major similarities and differences between TB infection and TB disease are shown later:

Tuberculosis: Infection vs disease

TB Infection	TB disease
M.TB. present	M.TB. present
Tuberculin skin test positive	Tuberculin skin test positive
Chest X-ray normal	Chest X-ray usually reveals lesion
Sputum smears and cultures	Sputum smears and cultures positive
No symptoms	Symptoms such as cough, fever, weight
Not infectious	Often infectious before treatment
Not defined as a case of TB	Defined

AIM OF THE WORK

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To detect: the total number of cases of extrapulmonary tuberculosis and its percentage in relation to pulmonary ones, during the last 5 years in Imbaba Chest Hospital.

REVIEW OF LITERATURE