Prevalence and diagnosis of Extra pulmonary Tuberculosis in Assuit Chest Hospital

Thesis

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In Chest Diseases

By

Mina Shohdy Boshra
(M.B.,B.Ch.)

Supervised by

Prof. Dr. Mohamed Sherif ElBouhy
Professor of Chest Diseases
Faculty of Medicine - Ain Shams University

Prof. Dr. Hesham Atef Abdel Halim
Professor of Chest Diseases
Faculty of Medicine - Ain shams University

Faculty of Medicine
Ain Shams University
2019

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List of Abbreviations

ABC .....ATP Binding Cassette

AIDS .....Acute Immunodeficiency Syndrome

ATS.....American Thoracic Society

BCG .....Bacillus Calmette & Guerin

CDC .....Centers for Disease Control and Prevention

DOTS.....Directly Observed Treatment Strategy

EMB.....Ethambutol

EPTB .....Extra Pulmonary Tuberculosis

GIT .....Gastro-Intestinal Tract

HCWs.....Health Care Workers

HIV .....Human Immunodeficiency Virus

INH .....Isoniazide

LAM .....Lipoarabinomannan

M tuberculosis .....Mycobacterium Tuberculosis

MAD .....Micotinamide Adenine Dinucleotide

MDR .....Multi Drug Resistant

MIC.....Minimal Inhibitory Concentration

MRI .....Magnetic Resonance Imaging

PZA.....Pyrazinamide

RIF .....Rifampicn

RNA .....Ribonudeic Acid

SM .....Streptomycin

TB.....Tuberculosis

TCH .....Thiophen-z-Carboxylic Acid Hydrozide

TNF-α .....Tumor Necrosis Factor Alpha

USA .....United State of America

List of Abbreviations

UTAH.....Utah Transplantation Affiliated Hospitals

WHO .....World Health Organization

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ABSTRACT

Background**:** Extra pulmonary tuberculosis (EPTB) more common than pulmonary tuberculosis (PTB) in Assuit Chest Hospital.

Objective**:** to know the prevalence of EPTB in comparison to PTB in Assiut chest hospital.

Methods**:** An eighteen months retrospective descriptive analysis to assess prevalence of all EPTB patients registered from January 2016 to June 2017 was carried out in Assuit Chest Hospital's DOTS clinic. Demographic data included patient's age, sex, address, marital status, level of education address and affected organs. Clinical presentation such as fever, cough, hemoptysis, night sweats, chest pain, weight loss and another symptoms according to affected system. Laboratory tests such as sputum analysis, x-ray chest, tuberculin test and biopsies.

Results**:** 127cases 64.14% are EPTB while 71cases 35.86% are PTB, 121 cases in urban area while 77 cases in rural area, 123 cases diagnosed by Biopsy,56 cases by sputum analysis,15 cases by CXR,4 cases by MRI, the most common sites of extra pulmonary disease were lymph nodes 29.13%, genitourinary 22.82%, bone and vertebral columne22.62%, GIT, spleen and peritoneum 14.18% then unclassified EPTB12.61%.

Conclusions**:** EPTB is more prevalent than PTB in Assuit chest hospital.

Key-words: Extra-pulmonary Tuberculosis – Pulmonary tuberculosis - Tuberculosis

INTRODUCTION

Tuberculosis (T.B) remains a major global public health problem even today. The world health organization (WHO) estimates that approximately 13 million people are infected with mycobacterium tuberculosis, and that infected individuals result in 8.8 million new cases of tuberculosis and 1.7 million deaths annually ***(Nunn et al., 2005).***

Extra Pulmonary T.B (EPTB) refers to disease outside the lungs. It is sometimes confused with non-respiratory disease. Disease of the larynx for example, which is part of the respiratory system, is respiratory but extra-pulmonary. In developed countries, 10-15% of TB cases have extra-pulmonary involvement, but in patients from high-incidence countries the rate is much higher. People who are HIV positive and infected with TB develop extra-pulmonary disease much more frequently, up to 50% of cases ***(Golden et al., 2005).***

EPTB can sometimes present with variable clinical picture intricating the diagnosis. The nonspecific symptoms include pyrexia of unknown origin, hepatosplenomegaly, lymphadenopathy, meningitis and rarely variety of hematological abnormalities, namely, anemia, pancytopenia, and leukemoid reaction ***(Avasthi et al., 2010).***

The most common presentation is pulmonary, extra pulmonary disease is not rare. The sites involved in EPTB are lymph nodes, abdomen, bones, joints including spine, genitourinary system and central nervous system. Some patients may present with miliary tuberculosis. Others may present with abscess, fistula and cutaneous lesion. Presentation of extra-pulmonary disease may be atypical or relatively insidious and tuberculosis may not be considered initially in differential diagnosis. This is an important phenomenon as delay in diagnosis may be crippling or even life threatening ***(Faiz, 2006).***

According to the World Health Organization (WHO), in 2015, 10.4 million individuals became ill with TB and 1.8 million died ***(WHO, 2016).***

A total of 985 patients with TB were enrolled in the study, including 224 (22.7%) with EPTB. The mean age (SD) of patients with EPTB was 34.7 (14.6) years. The prevalence of EPTB was at (22.7%), with TB lymphadenitis 79 (35.3%), marking the frequent form of EPTB followed by peritoneal TB 27 (12.05%).

The result of this study demonstrated that EPTB is more common among females, young patients and illiterates ***(Sreeramareddy et al., 2008).***

Aim of the Work

A retrospective study aiming to assess the prevalence of Extra- Pulmonary Tuberculosis in Assuit Chest Hospital from January 2016 to June 2017.

TUBERCULOSIS

Tuberculosis is an infectious disease caused by the bacillus Mycobacterium tuberculosis. It typically affects the lungs (pulmonary TB) but can affect other sites as well (extra pulmonary TB). The disease is spread in the air when people who are sick with pulmonary TB expel bacteria, for example by coughing. In general, a relatively small proportion of people infected with M. tuberculosis will develop TB disease; however, the probability of developing TB is much higher among people infected with HIV. TB is also more common among men than women, and affects mostly adults in the economically productive age groups ***(Global Tuberculosis Report, 2013).***

Historical aspects of tuberculosis

Tuberculosis, only a few decades ago, was believed to be under control and decreasing in incidence, in both developed and developing countries. A number of scientists and physicians have contributed to the understanding of tuberculosis and have been honored on postage stamps by severmenoufial countries around the world ***(Shampo et al., 2009).***

Tuberculosis (TB) has a long history. It was present before the beginning of recorded history and has left its mark on human creativity, music, art, and literature; and has

influenced the advance of biomedical sciences and healthcare. Its causative agent, Mycobacterium tuberculosis, may have killed more persons than any other microbial pathogen ***(Daniel, 2006).***

TB was documented in Egypt, India, and China as early as 5000, 3300, and 2300 years ago, respectively ***(Daniel, 2006).***

Typical skeletal abnormalities, including Pott's deformities, were found in Egyptian and Andean mummies and were also depicted in early Egyptian and pre-Colombian art ***(Sotomayor et al., 2004).***

Tuberculosis, also known as the white plague, received the title of "captain of all these men of death" by John Bunyan in the second half of the 17th century, when the disease reached a high level of death rates in Europe. Although it was probably described for the first time in Indian texts, pulmonary TB is known since the time of Hippocrates as "phthisis", which is derived from the Greek for "wasting away". In 1689, the English Doctor Richard Morton used the term "consumption" to specifically denote TB, & finally, in 1819, the inventor of the stethoscope, the French Doctor René Laennec identified for the first time the TB manifestation unit ***(Ducati et al., 2006)***.

One of the greatest works on TB was performed in 1882 by Robert Koch, an esteemed scientist of his time. Koch isolated and cultured M. tuberculosis from crushed tubercles. His experimental work identified the bacterium as the TB etiological agent ***(Daniel, 2006)***.

The tuberculin skin test became the principal tool for infection diagnosis. In the same period, Koch developed staining methods for the identification of the bacillus; these techniques were subsequently improved by the German Doctor and bacteriologist Paul Ehrlich, whose method for detection of the bacillus provided the basis for the development of the Ziehl-Nielsen staining, which still is an important tool to diagnose TB ***(Ducati et al., 2006)***.

In 1900, Calmette and Guerin discover the vaccine (BCG) that was obtained from attenuation of a strain of Mycobacterium bovis ***(WHO, 2012).***

Streptomycin (1943), P-aminosalicylic acid (1949), Izonaizid (1952), Pyrazinamide (1954), cycloserine (1955), Ethambutol (1962) and Rifampicin (1963) were introduced as anti-TB agents, leading to progressive decline in TB incidence in the industrialized countries ***(WHO, 2012).***

EPIDEMIOLOGY OF TB

Tuberculosis (TB) remains a major global health problem. It causes ill-health among millions of people each year and ranks as the second leading cause of death from an infectious disease worldwide, after the human immunodeficiency virus (HIV).

Tuberculosis (TB) is a top infectious disease killer worldwide. In 2014, 9.6 million people fell ill with TB and 1.5 million died from the disease. Over 95% of TB deaths occur in low- and middle-income countries, and it is among the top 5 causes of death for women aged 15 to 44. In 2014, an estimated 1 million children became ill with TB and 140,000 children died of TB. TB is a leading killer of HIV-positive people: in 2015, 1 in 3 HIV deaths was due to TB. Globally in 2014, an estimated 480,000 people developed multidrug-resistant TB (MDR-TB). The Millennium Development Goal target of halting and reversing the TB epidemic by 2015 has been met globally. TB incidence has fallen by an average of 1.5% per year since 2000 and is now 18% lower than the level of 2000 .The TB death rate dropped 47% between 1990 and 2015. An estimated 43 million lives were saved through TB diagnosis and treatment between 2000 and 2014 ***(WHO, 2015).***

Epidemiological situation in Egypt

Tuberculosis remains a public health problem in Egypt. Although Egypt is in the era of epidemiological

transition from communicable to non-communicable diseases like many other countries, TB, still, must be addressed and handled as a health problem affecting large sectors in the society, especially the poor and the vulnerable ***(NTP, 2012).***

Table (1): TB situation in Egypt (cases notification and burden) ***(WHO, 2015).***

Estimates of TB burden *2014	**Number (thousands)**	**Rate (per 100.000 population)**
Mortality (excludes HIV+TB)	0.22(0.2-0.25)	0.25(0.22-0.27)
Mortality (HIV+TB only)	0.043(0.35-0.051)	0.05(0.4-0.06)
Prevalence (includes HIV+TB)	23(12-37)	26(13-42)
Incidence (includes HIV+TB)	13(12-15)	15(13-16)
Incidence (HIV+TB only)	0.035(0.028-0.044)	0.04(0.03-0.05)
Case detection, all forms (%)	54(49-60)	
Estimates of MDR-TB burden *2014	**New**	**Retreatment**
% of TB cases with MDR-TB	3.4(1.9-4.9)	15(12-18)
MDR-TB cases among notified pulmonary TB cases	160(87-220)	89(72-110)
TB case notifications 2014	**New****	**Relapse**
Pulmonary, bacteriologically confirmed	3.697	309
Pulmonary, clinically diagnosed	886	0
Extra pulmonary	2.285	0
Total new and relapse	**7.177**	
Previously treated, excluding relapses	290	
Total cases notified	**7.467**	

Among 668 new cases:
429 (6%) cases aged under 15 years: male: female ratio: 1.4