EVALUATION OF

THE WORK OF GIZA CHEST DISPENSARY

FROM 1985 – 1990

THESIS

Submitted for Partial Fulfilment of the
M.Sc. Degree
(CHEST)

By

SAHAR SHAKER A. HAI
(M.B., B.Ch.)
(Cairo University)

Supervisors

Prof. Dr.
HUSSEIN ALI HUSSEIN
Professor of Chest Diseases
Faculty of Medicine
Ain Shams University

Prof. Dr.
ADEL GOMAA ALI
Professor of Chest Diseases
Faculty of Medicine
Ain Shams University

FACULTY OF MEDICINE

AIN SHAMS UNIVERSITY

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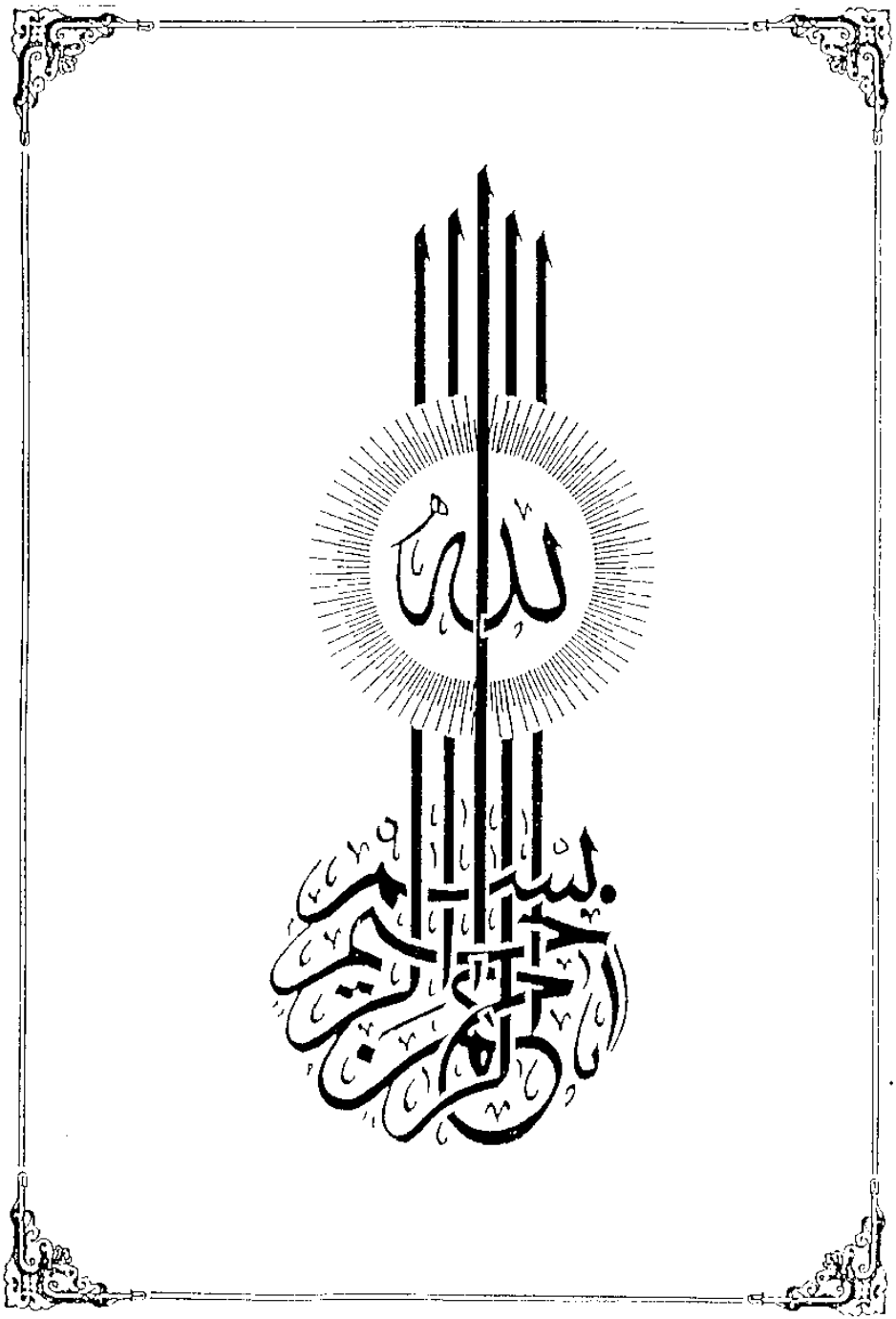

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The aim of the work is to analyse, evaluate and criticize the results of the routine work done in Giza Chest dispensary as regards tuberculosis over the years [1985 - 1990].

INTRODUCTION

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Tuberculosis and the other mycobacterial infections have been a major cause of morbidity and mortality throughout the world from time immorial. In this century, however, the annual infection rate has fallen dramatically in the developed countries and is still declining; but in developing countries tuberculosis is still a major cause of concern (Stead, 1978).

Description of tuberculosis can be recognized in many old medical writings usually as "phthisis" i.e. to dry up or "consumption" a chronic wasting illness associated with ulceration of the lung; as "galloping consumption" the pneumonic form of the disease; or as "scrofula" involvement of the cervical lymph nodes (Dubos, 1952).

The term tuberculosis (literally "a condition of little knots or swelling") has only recently come into general use for all the many manifestations of this disease, although three centuries ago Franciscus Sylvius recognized in cases of phthisis little nodules that he called tubercula (Lowell, 1969).

That the various forms of tuberculosis had a common and infectious etiology was first established by Villeman in 1865. He showed that inoculation of material from the various forms of tuberculous lesions caused a similar disease is rabbits (Lowell, 1969).

Discovery of tubercle bacillus by Koch in 1882 made it possible to make a definitive diagnosis of tuberculosis and to identify spreaders of the disease (Curry, 1964).

Koch in 1890 discovered tuberculin by which infected persons could be identified by the local reaction that followed the injection of a small amount of tuberculin into the skin.

The third major diagnostic procedure resulted from discovery of X-ray by Roentgen in 1895 making it possible to demonstrate pulmonary disease that had developed in infected persons before it could be recognized clinically and often before it had become communicable (Chapman, 1964).

Artificial culture media (1940s - 1950s) made it possible to detect much smaller number of tubercle bacilli than could be demonstrated by microscopic examination of stained specimens (Curry, 1964).

The history of tuberculosis control is closely entwined with the sanatorium movement which espoused healthful living with particular emphasis on rest, good food and fresh air (Curry, 1964). In addition, the concomitant isolation of patients during their treatment undoubtedly reduced the risk of transmission of their disease to others. Although the basic percepts of the sanatorium movement can be traced back to the temples of Aesculapius in Greek and Roman civilization, they did not receive wide public acceptance for treatment of tuberculosis until the successful establishment of sanatoria by Brehmer in the mountain of Silesia in 1854 and by Trudeau in the Adirondack mountains of the United States in 1882. Sanatorium treatment became the major tuberculosis control activity for decades, diminishing in importance only with the introduction of effective antibiotics, notably streptomycin in 1946 and isoniazid in 1952. Successful treatment on an outpatient basis then became possible (Dubos, 1952).

Attenuated strain of bovine tubercle bacilli by Calmette and Guerin between 1908 and 1922. A vaccine prepared from this strain came to be called bacille Calmette-Guerin (B.C.G.) (Lowell, 1969).

REVIEW OF LITERATURE

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MICROBIOLOGY OF TUBERCULOSIS

Mycobacterium :

Mycobacteria are widely distributed in nature. There are two main pathogenic species : 1) Mycobacterium tuberculosis associated with tuberculosis affecting man and certain mammals and 2) Mycobacterium leprae the cause of leprosy, a chronic disease of man only. Man may also be affected by Mycobacterium bovis, a primary pathogen in cattle and other mammals and very rarely by Mycobacterium avium, pathogenic to birds. A group of atypical mycobacteria may cause clinical or latent infections in man (Cruickshank et al., 1975).

Tubercle bacilli :

1. Morphology :

The tubercle bacillus appears as acid fast-alcohol fast rods with rounded or slightly flattened ends, straight or slightly curved, comma shaped or angular (Pagel and associates, 1964).

Their length varies from 2 to 4 µm their width from 0.2 to 0.5 µm (Crofton, 1989).

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2. Constituents of tubercle bacilli :

Jawetz et al. (1978) mentioned that the constituents listed below are found largely in mycobacteria cell wall :

a) Lipids : Mycobacteria are rich in lipids including fatty acids and waxes. In the cell, lipids are largely bound to proteins and polysaccharides. Lipids are probably responsible for most of the cellular tissue reaction to tubercle bacilli. Phosphatide fraction can

The bacilli often contain granules giving the organism a beaded appearance. These granules are now recognized as structures corresponding to mitochondria in higher organisms, concerned with oxidation-reduction reactions and possibly with the initiation of reproduction (Pagel and associates, 1964).

The tubercle bacilli is non motile, non spore forming, occuring singly, in clumps or in strands aligned in a parallel fashion (Hinshaw & Murray, 1980).

Dried tubercle bacilli kept in the dark may survive and remain virulent for many months but they can be killed by exposure to direct sunlight or ultraviolet rays (Hinshaw & Murray, 1980).

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produce tubercle cellular responses and caseation necrosis. Acid fastness depends on the integrity of the structure of the waxy envelope. Virulent strains of tubercle bacilli form microscopic serpentine cords in which acid fast bacilli are arranged in parallel claims. The cord factor is related to lipopoly-saccharides. It inhibits migration of leucocytes, causes chronic granulomas and can serve as an immunologic adjuvant. (All virulent mycobacteria are cord formers while not all cord formers are virulent).

b) Proteins : Each type of tubercle bacillus contains several proteins that elicit the tuberculin reaction. Proteins bound to a wax fraction can upon injection induce tuberculin sensitivity. They can also elicit the formation of a variety of anti-bodies.

c) Polysaccharides : Mycobacterium contain a variety of polysaccharides. They can induce the immediate type of hypersensitivity and can interfere with some antigen-antibody reactions in vitro.