COMPARATIVE STUDY IN MORBIDITY AND MORTALITY FROM PULMONARY AND EXTRAPULMONARY TUBERCULOSIS IN EGYPT AND SAUDI ARABIA

THESIS

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By

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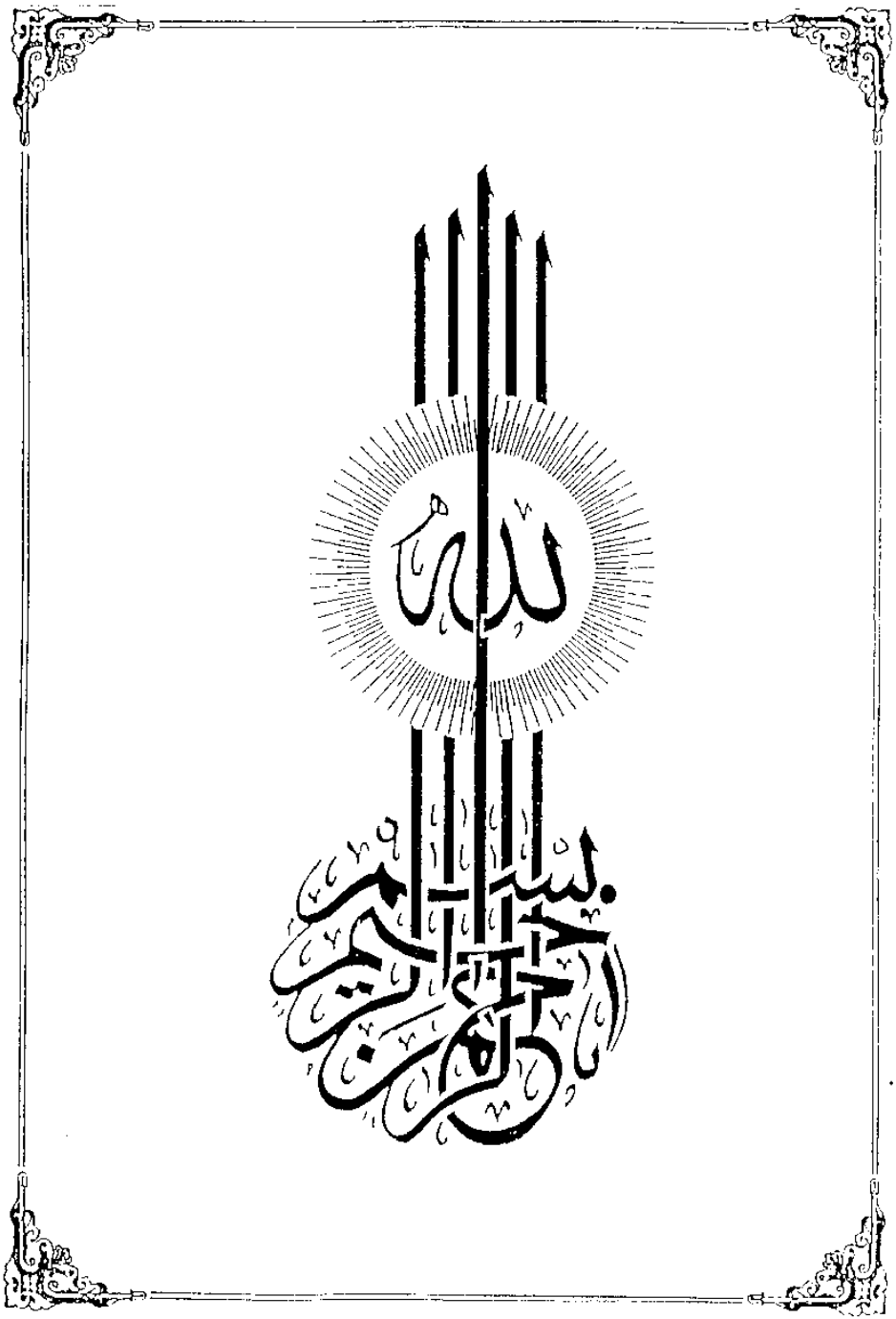

C O N T E N T S

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INTRODUCTION

I N T R O D U C T I O N

Tuberculosis is considered the world's most important communicable disease. This is easily forgotten in economically developed countries where the mortality has fallen dramatically and there has been an appreciable fall in morbidity, although in fact there are very great differences between different developed countries and within these countries the problem is often larger than is generally recognized (W.H.O. 1965).

In economically developing countries the disease is one of the principal causes of suffering and death.

Pulmonary tuberculosis is much the most important manifestations of the disease, both because it is far the most common and because patients with pulmonary tuberculosis are the principal sources of infection.

The World Health Organization estimates that there are 10 - 12 milion infectious cases in the world at any one time with about 3 milion deaths year (Lahler, 1970) More than three-quarters of the cases are in the developing countries.

With the development of modern transport and the frequency with which people now move about the world, no country can afford to regard tuberculosis as a purely parochial problem.

REVIEW OF LITERATURE

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Historical Review:

Tuberculosis is a disease that antedates, to Hippocrate (460 B.C) the Father of Medicine, who called it Phthisis which means "to dry up ". Evidence of spinal caries in certain Egyptian mumies indicate that tuberculosis was present at that time.

Tuberclosis probably reached its greatest height in Europe during the 18th century.

In 1882 Robert Koch discovered the tubercule bacillus which ranks one of the most important discoveries in bacteriology and in the history of medicine.

In 1892, Rontgen discovered X-rays, which later proved invaluable for the diagnosis of tuberculosis.

In 1907, Von Pirquet discovered the tuberculin test.

Soon after the First World War, B.C.G. vaccine was evolved by the French Scientists, Calmette and Guerin, and was tested in 1921.

The discovery of Streptomycin (1944), P.A.S. (1946) and Isoniazid (1951), have revolutionized the methods of tuberculosis control, and have given a hope that tuberclosis control would be attainable in reasonable time (Park, 1971).

Epidemiology of Tuberculosis:

Tuberculosis remains a major public-health problem as well as a social inspite of all one hears about the falling death rate of this disease.
The fact that mortality rate has been decreased in the past century and has dropped ten-fold during the past 50 years should not give us a sense of false security about its prevention. Hubbard (1957).

According to conservative estimates there are 10 to 20 milion cases of infectious tuberculosis in the world. This infectious pool is maintained by the occurance of 2 to 3 milion new cases and 1 to 2 milion deaths each year (W.H.O. 1967).

Tuberculosis takes its greatest toll in regions with low standard of living among under privileged classes of the population. Although many other factors are involved, it is to some degree a barometer of social welfare, the downward trend in many countries has followed improvement of housing, nutrition, working condition and the general standard of living of the masses.

To approach the epidemiology of tuberculous problem which is defined by Davis (1975) as "the complete study of various complex factors that influence a disease",

supposed to be one of the best methods for studying such problem as multifactorial disease.

Application of Epidemiology could be done in one of these different ways descriptive epidemilogy or analytical epidemiology or clinical epidemiology.
Descriptive method is considered to be easiest, the most available beside being ethically.
By studing the picture of Morbidity and Mortality of tuberculosis in a community and describe the difference that may be found in the study and compare it with other countries or areas, it could give an idea about the extend of the problem in the community.

Agent factor: Mycobacteria. Among the 14 species of mycobacteria classified by Bergey (Bergey, 1957). These are ordinarily referred to as tubercule bacilli.These are Mycobacteria tuberculosis (M. tuberculosis var hominis), M. bovis (M. tuberculosis var bovis) and M. avium.

Only the so called mamalian tubercule bacilli Mycobacteria tuberculosis and mycobacteria bovis are important causes of disease in man. However, human infections with the bovine type are now rare.
Mycobacteria avium rarely causes disease in man. It is of agricultural importance because it produces disease in fowls and swine. Tubercule bacilli are non spor -bearing, acid-fast, rod-shaped micro-organism which have relatively

simple growth requirments, although they grow quite slowely, each generation requring 18-24 hours on the average. Tubercule bacilli are destroyed by exposure to direct sunlight, heat and such disinfectants as phenol or tricresol solution. They are more resistant to chemical agents, especially acids and alkalies, and to antibacterial agents such as pencillin. They can remain viable for long periods in dried sputum. Maxcy,(1977)

A number of atypical mycobacteria have been isolated from man in recent years. Diseases attributed to them have resembled pulmonary tuberculosis and chronic cervical lymphadenitis . In 1929 Runyon classified them into four groups photochromogens, scotochromogens, non-photchromogens and rapid growers which are mainly saprophytic. The epidemiological significance of atypical mycobacteria is under study Park, (1971).

The principle source of infection is bacilli from the lungs and bronchi of persons with active pulmonary tuberculosis; the organisms are contained in respiratory secretions that are coughed up and expectorated or expelled in sneezing, talking, or other respiratory effort. The organisms thus liberated into the environment may be reduced to droplet nuclei which remain suspended until inhaled.

They may also be directly inhaled in the form of droplets or become adherent to dust particles which are inhaled when stirred up.
Wells and Lurine (1941) were able to infect rabbits by exposing them in chambers to aerosols of tubercule bacilli in suspension. Other possible mechanisms of infection are contamination of the hand with bacilli-laden secretions and contamination of food or eating utensils. Drinking unpasteurized milk from tuberculous cows may intiate infection of alimentary tract.

The principal portal of entery of the tubercule bacillus being the respiratory tract, primary lesions are most common in the lungs. They are usually found peripherally, indicating that the site of implantation is generally alveolar and that small inhaled droplet nuclei are likely vehicles for the organism.
The alimentary tract is less important portal of entery, its relative importance depends partly on opportunities for ingestion of contaminated milk or other foods. Marcy(1977)

While no age is immune to tuberculosis, the development of tuberculosis infection and disease is greatly influenced by this host factor. Tuberculosis infection increases steadily with age. In developed areas, age of first infection may be delayed to adult life (Omran, 1964).

In developing countries, there may be a small peak of morbidity and mortality in childhood, probably because of speedy growth at this age with attendant strain on their systems and increase in nutritional requirements. When infants and young children become infected, this indicates a near-by source of infection probably in the same houshold with the attendant risk of repeated exposure to high dosage of infecting bacilli. The most susceptables are young adulthood, this is due to stress of biological changes and activities at this age, child-bearing and mensturation in femals, engagment in industry or other occupation and increased physical and mental stresses. Old age is not immune to tuberculosis because of required resistance and accumulation of this age of cohorts (generations) of population who have had more exposure to infection under relatively more deleterious condition. Omran 1964.

In Egypt (Sayda Zenab district), it was found that high incidence of cases was found between 20-30 years in 1960 (24.88%) and 1975 (20.2%) with no significant differences statistically ($P > 0.05$) Ladkour, (1978).

Both males and femals are susceptible to tuberculosis, although the incidence is relatively lower in femals. With age however, young femals are more susceptible to tuberclosis probably because of the excessive physiologic

stress e.g. mensturation and child-bearing. In England and Wales in 1969, 9674 cases of pulmonary tuberculosis were traced; 6348 occured in men and 3326 in women. The present ratio in incidence between the sexes 2:1 males: females has been a characteristic for the last 10 years in the United Kingdom Davis (1971).

At one time it was thought that races without long history of tuberculosis were particularly liable to develop very rapidly fatal disease. Nevertheless, it is difficult to differentiate between racial susceptability and environmental condition. In most of the instances quoted the racial groups were also subjected to marked environmental stresses which could have affected their resistance to the disease. Katz & Kunofsky (1960).

In New York, American negroes, who have been exposed to tuberculosis and often live in poor environmental conditions had a tuberculosis mortality four times higher than white. Nevertheless, inspite of difficulty in assessment and complicating environmental factors, it seems highly probable that virgin population, previously unexposed to tuberculosis, have indead a lower resistance to the disease. Europeance and chinese, long exposed to the disease, have probably acquired increased resistance by natural selection.

Tuberculosis is not hereditary disease, but family and ethnic studies have shown that susceptiblity to disease is partly under genetic control (W.H.O., 1964) . However it has been long noticed that tuberculosis runs in families. House hold associates of active cases help in disease fast spread by native population (tuberculin negative persons) Mathur, (1971).
Jean Downes (1935) found thirteen times as many cases associates of "Index" cases as would be expected if the rate in the general population were applied to such families. Within the household itself, the degree of susceptibility and contraction of the disease parallels the degree of blood relation to the case, homozygous twins being the most susceptable. Once one of the pair falls sick with tuberculosis, the other is very likely to follow.

Lack of personal hygiene, habit of spitting discriminately, ignorance of protective devices as contacts or carlessness in handling infected materials all are certainly help in the spread of infection Park, (1971).
Also habit of consuming raw milk is very important in rural areas. The habit of routine physical check-up is most vital for early discovery of tuberculosis. The psychic attitude towards a diagnosis of tuberculosis is also important, as it may enhance or delay the process of recovery