

THE PROBLEM OF CHILDHOOD TUBERCULOSIS IN EGYPT



THESIS

Submitted in Partial Fulfilment
of the Master Degree
in Paediatrics

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ACKNOWLEDGEMENT

In all gratitude, I wish to express most sincere thanks to Professor Dr. ABD EL-KHALIK KHATTAB for honouring me with the supervision of this work. He gave me a lot of his precious time to complete and fulfil this integrated subject. Without his great patience, valuable advice, constant assistance, continuous encouragement and critical supervision, this study would have not been performed as it came.

Up to our knowledge, this is the first work done at the university level in Egypt to explore the magnitude of the whole problem country-wide.

I take this opportunity to extend my deep gratefulness and profound thanks to all Professors and the staff of pediatric department, Faculty of Medicine, Ain-Shams University, who contributed to deepen my knowledge in pediatrics.

Cairo, 1987

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LIST OF ABBREVIATIONS

A.R.E.	: Arab Republic of Egypt.
BCG	: Bacillus Calmette and Guerin
c-AMP	: cyclic Adenosine Mono Phosphate
CAPMAS	: Central Agency for Public Mobilization and Statistics. الجهاز المركزي للتعبئة العامة والإحصاء
CAPMAS-S.A	: CAPMAS- Statistics Annual.
CMI	: Cell-Mediated Immunity.
CMIR	: Cell-Mediated Immune Response.
CNS	: Central Nervous System
CSF	: Cerebro-Spinal Fluid.
D.R.	: Death Rate
D.T.H.	: Delayed Type Hypersensitivity.
EMB	: Ethambutol
FIA	: Freund's Incomplete Adjuvant.
ICD	: International Classification of Diseases.
IgM	: Immunoglobulin-M.
INH	: Isoniazid
M.C.H.	: Mounira Children's Hospital.
M.M.R	: Minute Mass Radiography.
M.TB	: Mycobacteria tuberculosis
N.TB	: Non- tuberculous mycobacteria.
OT	: Old Tuberculin.
P.A.S.	: Paraminosalycilic
P.A.S.B.	: Pan-America Sanitary Bureau.
PPD	: Purified Protein Dervitive
RMP	: Rifampin
SM	: Streptomycin
TB	: Tuberculosis.
TU	: Tuberculin unit
UNICEF	: United Nations Children's Fund
WHO-S.A.	: World Health Organization-Statistics Annual.
WHO-T.R.S	: World Health Organization- Technical Reports Series.

Introduction

INTRODUCTION

Tuberculosis is still a major scourge of mankind mainly in the developing part of the world, but it also remains an important problem in many technically advanced countries (Bulla, 1977 a). It is still one of the principal causes of death in developing countries including Egypt. At least three million people die of tuberculosis every year, and each year some four to five million new smear positives develop, infecting those around them. Probably at least another five million active cases arise annually with negative smears, many of whom are positive only on culture (Grzybowski, 1983).

In spite of remarkable advances recently achieved in case finding, treatment and prevention of tuberculosis, yet not a single country throughout the world has been able to reach the target point of control which represents less than 1% natural tuberculin positivity among the 14 year age group children (Donia, 1981).

In Egypt, tuberculosis is still the second health problem, it is next only to Schistosomiasis. It is among the 10 leading causes of death in children, being exceeded only by gastroenteritis, acute respiratory infections and malnutrition. The incidence of infection as revealed by tuberculin positive reactors below the age of 15 years is 20-30 per cent (Madkour et al., 1978).

Tuberculosis affects all age groups especially infants and children. In infancy it has a high fatality because of the tendency to occurrence of acute haematogenous forms of the disease, miliary tuberculosis and tuberculous meningitis. All types of tuberculosis are detected in the pediatric age group. Children seem most susceptible following a respiratory tract infection which may alter the local resistance. As a rule the younger the child at the time of infection the closer the infector in relationship (Miller, 1975).

Tuberculosis was proved to be one of the main causes of marasmus and Kwashiorkor. The fatality rate among the tuberculous cases is very high. 83.3% of the cases of marasmus and Kwashiorkor beyond the third year of life was due to tuberculosis.

This calls for urgent and active measures to be taken for the control of this preventable disease (El-Zawahry, 1974).

Tuberculosis is not likely to disappear in the near future. Efforts to cut the chain of infection will therefore have to continue for many years if the disease has be controlled (Bulla, 1977b).

Review of Literature

REVIEW OF LITERATURE
HISTORY OF TUBERCULOSIS

A disease that was probably tuberculosis was known as early as 1000 B.C. Hippocrates described the symptoms of a malady called "phthisis", meaning to waste away and recognized nodules (phymato) of the lung as a feature of the disease. Such nodules are called "tubercula" in Latin. The term "tuberculosis" was first applied to the clinical and pathologic description of the disease in 1834. The causative microorganism, discovered by Koch in 1882, became known as the tubercle bacillus. By 1900, in addition to the human tubercle bacillus (*Mycobacterium tuberculosis*), two additional species of tubercle bacilli (*Mycobacterium bovis* and *Mycobacterium avium*) were recognized to cause disease in man, as well as infections in cattle and birds. (Harris and McClement, 1983).

There is an excellent description of the symptomatology and pathology of tuberculosis in the Arabic manuscripts: "Al-Canon" by Ibn-Sina (A.D. 1036), "Al-Hawi Fi El-Tib" by Al-Razi (A.D. 925). (Al-Damluji and Bignall, 1976).

The peak incidence of the disease probably occurred in the nineteenth century, as a result of rapid urbanization and poor living conditions that followed the industrial

revolution. It was called the "Capten of the Men of Death", and before it was known as "white plague" or "consumption", and thought to be a degenerative hereditary condition (Huber, 1982).

The findings of radiology and bacteriology helped in developing further knowledge of the disease. Many achievements have been gained in the battle against tuberculosis in the last forty years. This is attributed to improved socioeconomic conditions and discovery of antituberculous drugs, streptomycin (1944), para-aminosalicylic acid (1946) and isoniazid (1951). New drugs: rifampicin and ethambutol (1968) have greatly improved the case rate of tuberculosis (Lefford, 1981).

Epidemiology

Transmission:

Aerosolized droplets of liquid, three to five microns in size, contain tubercle bacilli. Dissemination of such droplets occurs if generation within the respiratory system of a person with active ulcerative lesions of the lung is coupled with expulsion during talking, sneezing, or coughing which is the most important mechanism (Louden and Sophn, 1969). Small droplets give droplet nuclei by rapid evaporation of water. These remain suspended in the

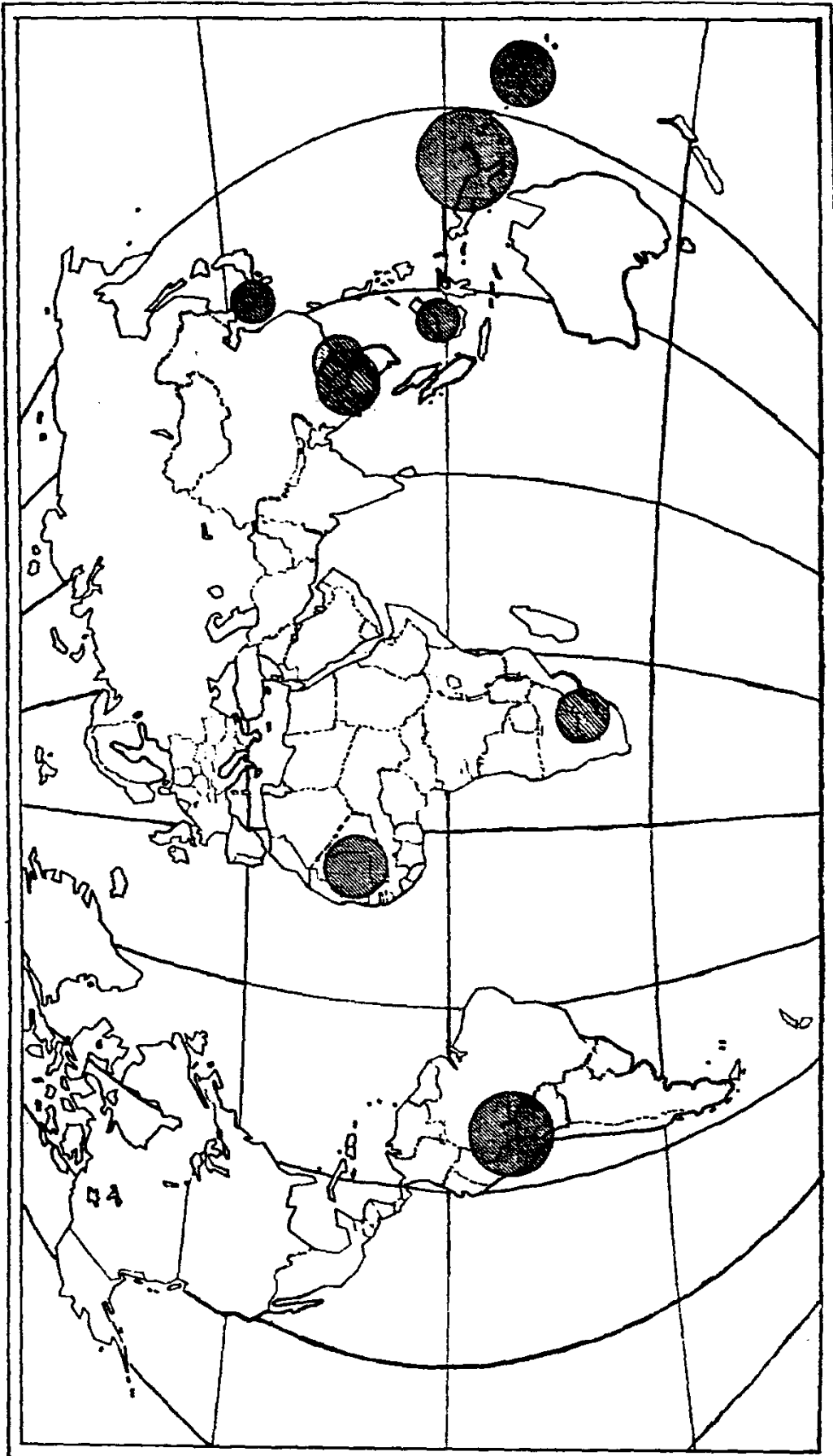
air for long periods. Inhaled large particles are deposited in the upper respiratory passages which is relatively resistant to tuberculous infection and they are usually expelled (Harris and Mc Clement, 1983).

Thus in spreading of childhood tuberculosis the source of infection is usually an adult with sputum positive pulmonary tuberculosis. The unknown cases are more dangerous than the known ones under treatment, even if the latter is sputum positive (Udani, 1981).

Children with primary tuberculosis rarely infect other children. Most of them have no symptoms and produce no sputum. Children play an important role in transmission of tuberculosis because they may harbour a partially healed infection that lies dormant, only to reactivate as infectious pulmonary tuberculosis many years later. Thus infected children constitute a long lasting reservoir of tuberculosis in the population (Phelan et al., 1982).

Tuberculosis can be acquired by ingestion of large inocula of tubercle bacilli, but now decreased after control of bovine tuberculosis and pasteurization of milk. Transmission by contaminated fomites is rare. Accidental percutaneous inoculation may rarely occur. Venereal transmission from tuberculosis of the prostate is extremely unusual (Wolinsky, 1983).

Fig. 1. Areas of high tuberculosis incidence in the world in 1971.



(After: Bulla, 1977 b).