NON TUBERCULOUS MYCOBACTERIAL CLINICAL DISEASES

ESSAY

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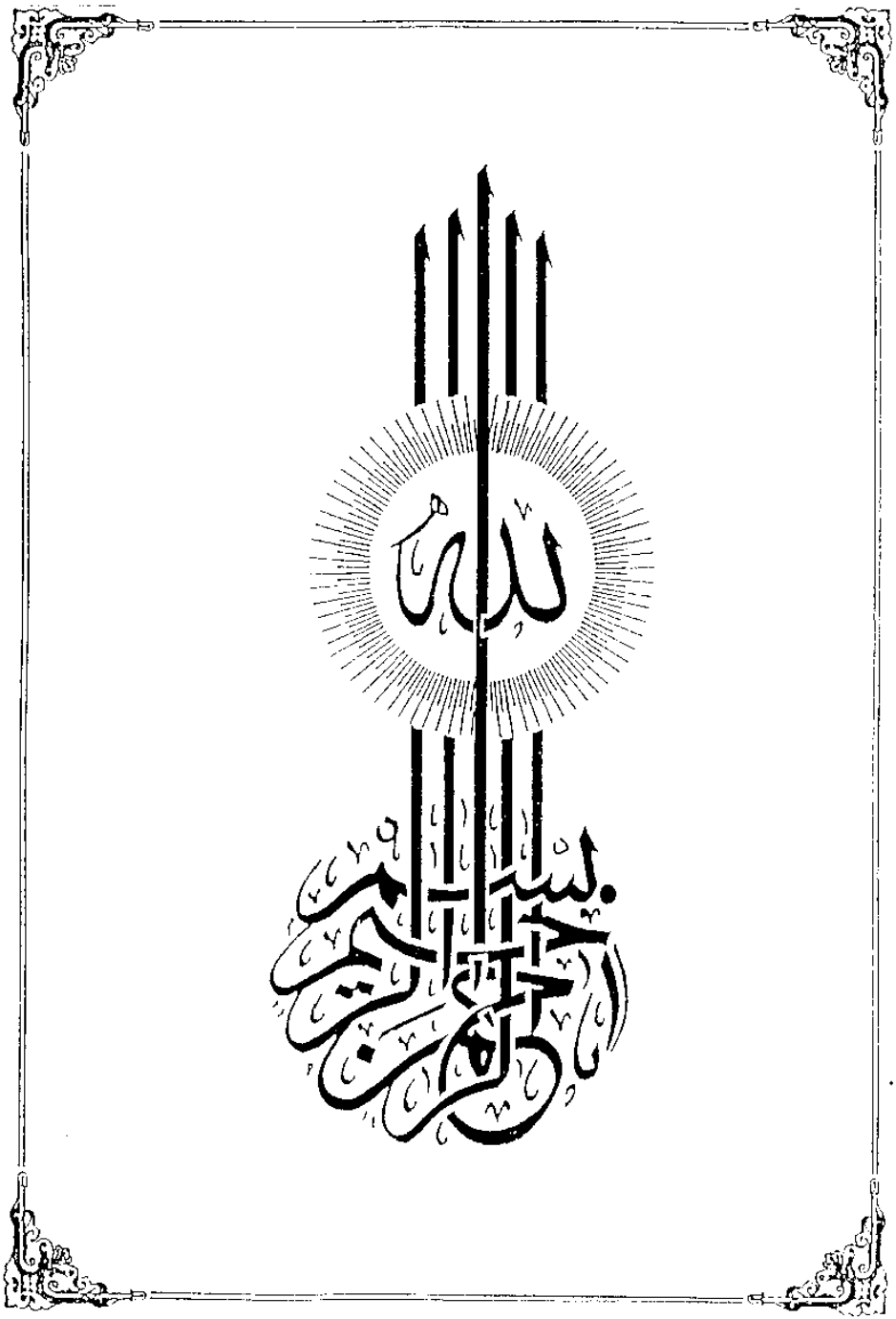

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INTRODUCTION

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In addition to tubercle bacilli (M.tuberculosis, M. bovis), other mycobacteria of varying degrees of pathogenicity have been grown from human sources in past decades.(Jawetg, 1991).

Koch's discovery of the tubercle bacillus was announced in 1882, and before the end of the century the bovine, avian, reptilian, piscine, and saprophytic varieties of mycobacteria had been described. Despite sporadic reports of the isolation of many varieties of nontuberculous mycobacteria from clinical specimens in the early part of the twentieth century, however,the only mycobacteria that were taken seriously as a cause of human disease were those we now call Mycobacterium tuberculosis and Mycobacterium bovis. This was not surprising because clinicians were completely occupied with the overwhelming task of trying to cope with "ordinary" tuberculosis.(Wolinsky, 1979).

In the early 1950s, after it had become routine to culture rather than merely to smear specimens for acid-fast bacilli (AFB), and when the prevalence of

tuberculosis began to decrease rapidly, a new concept about mycobacterial infection began to arise. Keener bacteriologic and clinical correlation, as well as a better understanding of the relationship between small skin test reactions to tuberculin and infection with organisms other than the tubercle bacillus, brought the new concept into sharper focus.(Wolinsky, 1979).

It is probable that pulmonary disease due to mycobacteria other than M.tuberculosis and M. bovis has been occurring for many years though usually mistaken for tuberculosis. More recently the closer study of patients whose bacilli were found resistant to the standard drugs has made physicians realize that some of the resistant strains are not in fact classical tubercle bacilli. Most of these strains have now been classed as separate species.(Crofton, 81).

The prevalence of pulmonary nontuberculous mycobacterial infection in the United States shows marked geographic variability; the proportion of cases of pulmonary infection due to nontuberculous mycobacteria (NTMB) is increasing,however, and in some areas NTMB infection has become the predominant form of pulmonary mycobacterial infection. (Woodering, 1990).

Nontuberculous mycobacterial pulmonary infections have become more common in recent years. The diagnosis is often overlooked because the findings may be subtle or because the radiographic appearance may change slowly or not at all for long periods of time. The radiographic manifestations of NTMB pulmonary disease resemble those of tuberculosis. Most patients do not have cavitary disease; rather, their radiographs most often show one or more areas of clustered fibroproductive nodules that are frequently misinterpreted as being old or inactive, which contributes to a significant delay in diagnosis and therapy. The tendency for active NTMB pulmonary disease to remain radiographically stable for long periods of time further complicates radiographic diagnosis. (Woodering, 1990).

Awareness of the radiographic appearance of the non tuber-culous mycobacterial pulmonary infections will facilitate their diagnosis so that appropriate therapy may be initiated before the disease is far advanced. (Woodering, 1987).

HISTORICAL PERSPECTIVE

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The early efforts at classification and differentiation of mycobacteria were summarized by Wilson in 1925. Tuberculosis-like diseases of coldblooded animals and the bacilli that caused them were re-examined and reviewed by Aronson in 1957 and by Schwabacher in 1959. Early reports of nontuberculous AFB in human secretions date back to 1885, when Alvarez and Tavel described the smegma bacillus. There was a report in 1900 of a rapidly growing AFB, probably Mycobacterium fortuitum, from the tonsillar crypt and from the sputum of another patient. Ohlmacher in 1901 described a thin, branching, acid-fast organism from the sputum of an epileptic young woman who had cough, fever and purulent sputum. The material was not virulent for guinea pigs, and the pictures show what appear to be Nocardia like bacilli or filaments. In the next year, there appeared the description of long, thin AFB in clumps repeatedly found in the sputum of a patient who had recurrent attacks of hemoptysis and purulent sputum. Lichtenstein in 1902 called them pseudotubercule bacilli, but cultures were unsuccessful. The first report of a chronic injection site abscess caused by AFB followed in 1904.

The rapidly growing bacilli from this lesion probably belonged to the M. fortuitum complex. Similar AFB were noted in 1918 in the chronic pustular skin lesions of an English soldier who had been wounded in battle. (Wolinsky, 1979).

Aronson in 1926 described and named Mycobacterium marinum as the cause of a disease in salt water fish in the Philadelphia aquarium. He recorded that the colonies "assumed a lemon yellow color which later became a deep orange", and he studied the solubility of the pigment in various solvent. (Aronson, 1926).

The Ryan strain was isolated from pleural empyema of an infant with pneumonia, although the relationship of the AFB to the child's pulmonary disease was no clear. (Beaven,1931).

A number of "atypical acid-fast organisms" observed in a clinical laboratory were described by Pinner in 1932. Included were 11 pigmented strains derived from human material, all of which produced only local self-healing lesions in guinea pigs.(Pinner, 1932).

Pinner in 1935 described 15 slowly growing, pigmented AFB isolated from human material. Seven strains came from urine, and apparently there was little or no evidence to associate them with the patients disease. (Pinner, 1935).

In 1938, Cruz described and named M. fortuitum.(Cruz, 1938).

Freeman in 1938 reported the cases of 2 women who had recurrent widespread, superficial abscesses from which pigmented, rapidly growing AFB were cultured; one patient had disseminated disease in several other organs. (Freeman,1938).

Lester in 1939 reported that 130 strains of "saprophytic"AFB were cultured from among 26,343 human specimens, but in only 12 instances was a heavy growth noted.(Lester, 1939).

Feldman and co-workers in 1943 reported the recovery of an avian like bacillus from a man with silicotuberculosis. (Feldman 1943).

The recovery of pigmented nonpathogenic AFB from the sputum of a patient with lung abscess after tooth extraction was noted by Cory in 1945. (Cory, 1945).

An AFB of the M. fortuitum complex was considered to be the cause of arthritis of the knee and superficial abscesses in a patient described in 1953. (Moore, 1953).

Karlson and Feldman in 1953 described the results of laboratory studies of M. avium like AFB isolated from 6 cases of silicotuberculosis. These studies included seroagglutination and animal virulence tests. Two of the strains were apparently classic M. avium, but the other 4 were examples of M. intracellulare. Karlson and Feldman pointed out that" these strains of little or no virulence may actually be avian tubercle bacilli that had lost their pathogenicity for chickens owing to prolonged residence in a heterologous host." (Karlson, 1953).

Palmer in 1953 called attention to the non specific nature of the weak skin reactions to tuberculin purified protein derivative (PPD) seen in some populations and speculated that they might be due to infection with mycobacteria other than mammalian tubercle bacilli.

(Palmer,1953).

Timpe and Runyon in 1954 correlated the known facts about the relationship between human pulmonary disease and nontuberculous mycobacteria and provided the first working classification of the organisms. (Timpe, 1954).