ISOLATION OF ATYPICAL MYCOBACTERIA FROM CLINICAL MATERIAL IN MALAYSIA

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SUMMARY

During the period 1979-1982, 70 strains of atypical mycobacteria isolated from clinical material were identified as belonging to species or species complex. Twenty-eight out of 61 strains isolated from pulmonary specimens were identified as ***M. avium-intracellulare.*** *This frequency of association of* ***M. avium-intracellulare*** *with sputa of patients with pulmonary symptoms points to its potential importance and the need for further investigation.*

INTRODUCTION

The designation 'atypical' mycobacteria is commonly used to describe mycobacteria other than *Mycobacterium tuberculosis* and *M. bovis*. Other terms that have been used to mean the same thing are 'unclassified', 'anonymous', 'opportunistic' and 'non-tuberculous' mycobacteria.

The isolation of atypical mycobacteria from clinical material has been reported since the early part of the twentieth century but their ubiquitous distribution in nature and lack of virulence for the guinea pig led early investigators to conclude that they were strictly saprophytic species. Their occasional isolation from clinical material was assumed to be completely fortuitous. However, since the 1950's, with the recognition of two new mycobacterial infections, the Bairnsdale ulcer [1] and the swimming pool granuloma, [2] there has been an increasing awareness of the clinical significance of these mycobacteria in relation to human disease. It is now widely accepted that many of these atypical mycobacteria are important pathogens for both man and animals.

The incidence, epidemiology and clinical features of atypical mycobacterioses have been well documented and highlighted in many countries. [3-7]

This paper describes the preliminary results of a study undertaken at the Bacteriology Division, Institute for Medical Research, Kuala Lumpur, to ascertain the importance of atypical mycobacteria as human pathogens in Malaysia.

MATERIALS AND METHODS

The mycobacterial strains studied were mainly strains referred for identification to the Bacteriology Division, Institute for Medical Research, by the National Tuberculosis Centre, Kuala Lumpur. Other strains were isolated from clinical material received in our laboratory. The clinical material received was processed by Petroff's method [8] and inoculated on Lowenstein-Jensen medium and incubated at 37° C for 8 weeks.

Acid-fast isolates were identified as belonging to

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TABLE I
ATYPICAL MYCOBACTERIA FROM CLINICAL MATERIAL

Species	Clinical Source				Total
	Sputum	Urine	Pus	Laryngeal Swab	
M. avium-intracellulare	28	2	—	—	30
M. scrofulaceum	4	1	—	—	5
M. szulgai	1	—	—	—	1
M. fortuitum	16	3	1	—	20
M. chelonei	8	1	—	1	10
M. gordonae	4	—	—	—	4
Total	61	7	1	1	70

a species or a species complex with the aid of the following identification tests: Niacin test (Difco TB Niacin Test Strip); growth rates at room temperature, 37° C and 42° C [9], pigment production in the dark and light; [10] hydrolysis of Tween 80 at 5 and 10 days (Difco TB Hydrolysis Reagent); Reduction of nitrate [9]; Arylsulfatase Test at 3 days (BBL, Wayne Sulfatase Agar); Semiquantitative Catalase Test [9]; Catalase Test at 68° C, pH 7 [9]; Urease Test [11]; β-glucosidase Test. [12]

RESULTS

From December 1979 to June 1982, a total of 87 strains of atypical mycobacteria isolated from 72 sputum, 10 urine, two pus, two tissue biopsy and one laryngeal swab specimens were received for identification.

We have been able to speciate 70 strains using the identification tests listed above. Their identification and the clinical material from which these strains were obtained are shown in Table I.

DISCUSSION

It is now well accepted that mycobacteria other than *M. tuberculosis* and *M. leprae* are important pathogens for man. Two species or complexes have emerged as the predominant pathogens, namely *M. kansasii* and *M. avium-intracellulare*. In addition, *M. marinum* is known to be the causative agent of swimming-pool granulomas, *M. ulcerans* of Buruli or Bairnsdale ulcers and *M. fortuitum* complex is commonly associated with local abscesses.

The mycobacterioses caused by the atypical mycobacteria may involve a wide variety of tissues especially the lungs, lymph nodes, skin, soft tissues, bones and joints. [13] They usually occur in compromised hosts like immunosuppressed patients but sometimes occur in previously healthy patients.

Chronic pulmonary disease resembling tuberculosis is the most important clinical problem associated with atypical mycobacteria. [13] These infections may so closely resemble tuberculosis that no diagnosis can be made on clinical, radiological and histopathological grounds alone. Definitive diagnosis is dependent on the laboratory isolation of the causative mycobacterium.

The majority of our strains were isolated from sputum specimens from patients having pulmonary symptoms. Our preliminary findings showed that out of 61 isolates from sputa, 28 were identified as *M. avium-intracellulare,* 16 as *M. fortuitum,* eight as *M. chelonei,* four each as *M. scrofulaceum* and *M. gordonae* and one as *M. szulgai.* However, care has to be exercised in the interpretation of the results. A positive culture should be interpreted by considering the possibility of environmental contamination, known pathogenic potential of the recovered species and the frequency of isolation from repeated specimens. [13]

Taking these factors into consideration, our findings indicate that the role of *M. avium-intracellulare* as an important cause of atypical pulmonary disease should be investigated more fully. This is of importance because *M. avium-intracellulare* is relatively resistant to a large number of anti-tuberculous drugs and disease associated with this organism usually does not respond well to drug treatment. [14,15]

Our preliminary study suggests that further investigation into the incidence, nature and clinical significance of these strains is useful in order to establish their role in atypical mycobacterial infections.

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