



***STUDY ON THE INCREASING
CLINICAL IMPORTANCE OF THE ATYPICAL
MYCOBACTERIA " TUBERCULOID BACILLI "
WITH SPECIAL EMPHASIS ON ITS
LABORATORY DIAGNOSIS AND TREATMENT***

Essay

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in Clinical and Chemical Pathology

By

Dr. Seham Abd El-Hamed Radwan Hasan

M.B.B.ch.

616.07
S. A

53987

Supervisors

Prof. Dr. Ragaa Mahmoud Lasheen

Prof. of Clinical and Chemical Pathology
Ain Shams University

Dr. Amira Mohamed Mokhtar

Assistant Prof. of Clinical and Chemical Pathology
Ain Shams University



***Faculty of Medicine
Ain Shams University
1995***

[Handwritten signatures and stamps]



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CONTENTS

| | <i>Page</i> |
|--|-------------|
| - INTRODUCTION AND AIM OF THE WORK | 1 |
| - REVIEW OF LITERATURE | |
| I. Tuberculoid Bacilli | 5 |
| - Historical aspect | 5 |
| - Classification | 7 |
| - Morphology and structure of the cell wall | 11 |
| - Environmental and growth requirement | 13 |
| - Antigenicity | 16 |
| - Immune response | 17 |
| - Epidemiology | 19 |
| - Resistance to physical and chemical agents | 21 |
| II. Tuberculoid Bacilli Infections | 23 |
| - Pathogenesis | 26 |
| - Clinical significance | 28 |
| - Clinical Manifestations. | 29 |
| - Radiological findings. | 30 |
| - Differential diagnosis. | 31 |
| - Prognosis. | 31 |
| - Other Organisms Less Commonly Causing Pulmonary Disease. | 32 |
| - Extrapulmonary Diseases Caused by Tuberculoid Bacilli : | 33 |
| - Tuberculoid bacilli infection in patients with AIDS | 36 |
| III Laboratory diagnosis of tuberculoid bacilli infection | 40 |

| | |
|---|-------|
| - Specimen collection and processing | 40 |
| - Direct methods of diagnosis | 46 |
| - Staining and microscopy. | 47 |
| - Culture and environmental requirement | 52 |
| - Identification of isolates | 60 |
| - Rapid identification: | 60 |
| - Identification by radioactive methods (BACTEC system) | 60 |
| - Biphasic Septi-Chek culture media | 62 |
| - Identification by molecular method | 64 |
| - Traditional approach : | 66 |
| - Presumptive identification: | 66 |
| - Rate of growth and growth in relation to temperature | 66 |
| - Pigmentation and photoreactivity. | 68 |
| - Definitive identification | 68 |
| - Chromatography | 78 |
| - Direct specimen assay | 81 |
| - Antimicrobial susceptibility | 85 |
| - Drug resistance | 88 |
| - Indirect methods of diagnosis | 90 |
| - Skin test. | 91 |
| IV Treatment of tuberculoid bacilli infection | 95 |
| V Prevention of tuberculoid bacilli infection | 100 |
| SUMMARY | 102 |
| REFERENCES | 106 |
| ARABIC SUMMARY | ----- |

LIST OF ABBREVIATIONS

| | |
|--------|---|
| AE-DNA | : Acridinium ester-labelled-DNA |
| AFB | : Acid fast bacilli |
| AIDS | : Acquired immunodeficiency syndrome |
| BAL | : Bronchoalveolar lavage |
| BCG | : Bacille calmette Guerin |
| CFU | : Colony-forming unit |
| CIP | : Ciprofloxacin |
| CLA | : Clarithromycin |
| CPC | : Cetylpyridinium chloride |
| CSF | : Cerebrospinal fluid |
| ELISA | : Enzyme linked immunosorbent assay |
| GI | : Growth index |
| GLC | : Gas-liquid chromatography |
| HIV | : Human immunodeficiency virus |
| HPA | : Hybridization protection assay |
| HPLC | : High performance liquid chromatography |
| IFN | : Interferon |
| L-J | : Lowenstein-Jensen |
| M. | : Mycobacterium |
| MAC | : Mycobacterium avium complex |
| MAI | : Mycobacterium avium-intracellulare |
| MAIS | : Mycobacterium avium-intracellulare-schrofulaceum |
| MB | : Middlebrook |
| MOTT | : Mycobacterium other than tubecle bacilli |
| M.TB | : Mycobacterium tuberculosis |
| NALC | : N-acetyl-L-cysteine |
| NAP | : p-nitro- α -acetylamino- β -hydroxypropionophene |
| PBL | : Prepheral blood lymphocyte |
| PCR | : Polymerase chain reaction |
| PPD | : Purified protein drivative |
| Py-MS | : Pyrolysis mass spectrometry |
| RIF | : Rifambin |
| T.B. | : Tuberculosis |
| TCH | : Thiophene-2-carboxylic acid hydrazide |
| TLC | : Thin-layer chromatography |
| TSA | : Tuberculostearic acid |

List of Tables

| | <i>Page</i> |
|---|-------------|
| Table, I : Recognized Species of Mycobacteria | 8 |
| Table, II : Growth of Mycobacteria. | 15 |
| Table, III : Clinical Significance of Atypical Mycobacteria. | 24 |
| Table, IV : Reporting Acid-Fast Bacilli in Fuchsin Stained Smears. | 52 |
| Table, V : Non-selective Mycobacterial Solid Isolation Media. | 54 |
| Table, VI : Selective Mycobacterial Isolation Media. | 56 |
| Table, VII : Morphologic Characteristics of Clinically Significant Mycobacteria. | 58 |
| Table, VIII : Distinctive Properties of Mycobacteria Encountered in Clinical Specimens | 70 |

List of Figures

| | <i>Page</i> |
|---|-------------|
| Figure, I : A flow Chart for Specimen Processing for Isolation of Mycobacteria. | 44 |
| Figure, II : Algorithm for Processing BACTEC 12B Bottles for Probe. | 63 |
| Figure, III : Preliminary Subdivision of Mycobacteria. | 67 |
| Figure, IV : The Identification of Mycobacteria. | 78 |

INTRODUCTION
AND
AIM OF THE WORK

INTRODUCTION

Genus *Mycobacterium* is one of the most widely distributed bacterial genera in nature. The generic name *Mycobacterium* was given to a group of bacteria which grow as mould-like pellicles on liquid media (Grange, 1994). Genus *Mycobacterium* comprises, a large group of acid-fast, alcohol-fast, aerobic or microaerophilic, non-motile, non-sporforming bacilli, 0.2 to 0.6 x 1 to 10 µm in size. They occasionally form branched filaments, but these can be readily disrupted (Murray et al., 1994).

The lipid content of mycobacterial cell wall is very high, the most characteristic components are genus-specific, alpha-hydroxy branched chain fatty acids of high molecular weight " **mycolic acid** ". The mycobacterial cells are difficult to stain, but once stained resist decolourization with acid and alcohol. They are Gram-positive, but some species are poorly colored even after prolonged staining. They are straight or slightly curved rods, but coccobacillary, filamentous and branched forms also may occur (Laidlaw, 1989).

This bacteria have a generation time of approximately 20 hours, and thus their isolation and identification may take up to 6 weeks. Catalase, niacin production, reduction of nitrate to nitrite and many other tests used to diagnose mycobacterial species (Hall and Howard, 1994). The genus *Mycobacterium* includes numerous pathogens and saprophytic organisms. They includes over 30 species, most of which are well defined. The commoner species are classified into:

1. The typical tubercle bacilli, *M.tuberculosis* and *M.bovis*.
2. The atypical mycobacteria, including commensal,

saprophytic, and opportunistically pathogenic species.

3. The *Mycobacterium leprae*.

4. The strict animal pathogens (*Baron et al., 1994*).

The atypical mycobacteria have many other names, including pseudotubercle bacilli, unclassified mycobacteria, non-tuberculous mycobacteria, tuberculoid bacilli, opportunistic mycobacteria, environmental mycobacteria, anonymous mycobacteria, and mycobacteria other than tubercle bacilli " MOTT " which is the preferred term (*Yeager and Jr, 1994*). Many tuberculoid bacilli occasionally cause opportunistic infections in man indistinguishable clinically, radiologically and histologically from that caused by the human tubercle bacilli (*Lillo et al., 1990*). And may present diagnostic and therapeutic difficulties (*Hopkin, 1995*).

The rate of isolation of MOTT had increased over the past several years; in some areas, the isolation rate for *Mycobacterium avium-intracellulare* has risen than that for *M.tuberculosis*. Simultaneously, the spectrum of clinical manifestations associated with the various species has widened. Mycobacteria other than tubercle bacilli differ from *M.tuberculosis* in several respects. They are widely spread in nature, and their pathogenic potential for humans varies; they may colonize on individual without causing invasive disease (*Hoover, 1995*). Thus in contrast to *M.tuberculosis* which is always considered a pathogen when isolated, but MOTT, when isolated are not necessarily equated with disease (*Shafer and Sierra, 1992*). The isolation of a tuberculoid bacillus on a single occasion is not a sufficient evidence that it is the cause of the patient's illness; it may be a secondary invader or a contaminant. Three to six isolations of the organism are