

بسم الله الرحمن الرحيم

**Sudan University of Science and Technology
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Reliability of Mycolic Acid IgG Antibodies in the Diagnosis of Pulmonary Tuberculosis

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ميكروبيولوجيا

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الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾ خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ ﴿٢﴾ اقْرَأْ وَرَبُّكَ الْأَكْرَمُ ﴿٣﴾ الَّذِي عَلَّمَ
بِالْقَلَمِ ﴿٤﴾ عَلَّمَ الْإِنْسَانَ مَا لَمْ يَعْلَمْ ﴿٥﴾

صدق الله العظيم

سورة العلق الآيات 1-5

Dedication

**I dedicate this research to
My father.....
My mother.....**

**Whom taught me how I could be
human being
My brothers and sisters....**

My friends and my colleagues.....

**The persons whom I love, respect
and appreciate.....**

&

Every one from whom I learned...

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ABSTRACT

This study aimed to test the reliability of mycolic acid IgG antibodies compared to PCR among patients suspected to have pulmonary tuberculosis in Khartoum State.

Sputum and blood specimens were collected from patients attended to Alsha'ab Teaching Hospital, Tuberculosis Reference Laboratory, Ibrahim Malik Hospital and Abu Anga Hospital. All patients were priorly informed.

Smear from direct sputum specimens (90) showed that 17 (18.9%) were ZN positive, while 73 (81.1%) were negative. The 90 sputum specimens were cultivated on LJ medium and incubated at 37°C, 15 (16%) showed typical characteristics of *M. tuberculosis*, the morphological features were dry, tough and pale color colonies, while 75 (84%) showed no obvious growth or contaminated.

The biochemical tests showed sensitivity for para nitro benzoic acid test, negative for thiophin-2- carboxylic acid hydrazide, positive for nitrates oxidation and negative for catalase test at 68°C.

The ninety sputum specimens were subjected to PCR to ampilify IS6110 segment. The result showed that 79 (87.8%) were positive for IS6110 while 11 (12.2%) were negative.

Eighty Serum samples were analysed by ELISA, 16 (20%) gave positive result for antimycolic acid IgG while 64 (80%) were negative.

This study suggested that detection of antimycolic acid antibodies is a promising rapid and reliable technique in the diagnosis of pulmonary tuberculosis.

النتائج

هدفت هذه الدراسة لمعرفة جدوى الكشف عن أجسام الغلوبيولين (ج) الخاصة بحمض المايكولييك لدى المرضى الذين يعتقد إصابتهم بمرض السل الرئوي مقارنة مع تفاعل البلمرة التسلسلي بولاية الخرطوم.

جمعت عينات الدم و البلغم (القشع) من مستشفى الشعب التعليمي ومعمل الدرن المرجعي، ومستشفى أبو عنجة ومستشفى ابراهيم مالك. المرضى تم إعلامهم بهذه الدراسة. المسحات التي أخذت من 90 عينة بلغم (القشع) تم صبغها بالذهيل نيلسن وأظهرت نتائج الاختبار 17 (18.9%) موجبة و 73 (81.1%) سالبة.

من جملة 90 عينة بلغم تم عزل 15 (16%) للبكتيريا المتفطرة السلية على وسط ليوستين جنسن عند درجة حرارة 37 درجة مئوية أظهرت خصائص البكتيريا المتفطرة السلية البشرية (جافة ، خشنة وبلون شاحب) كما أنها عند إجراء الاختبارات الحيوكيميائية لها كانت حساسة لاختبار حمض البارابنزويك ومقاومة لاختبار الثيوفين-2-كاربوكسيلك أسيد هيدرازيد وكانت موجبة لاختبار اختزال النترات وسالبة لاختبار الكاتاليز. بينما 75 (84%) لم يحصل لها نمو واضح أو كانت ملوثة.

كما وجد أن من جملة 90 عينة بلغم تم اختبارها بواسطة تفاعل البلمرة التسلسلي ، 79 (87,8) كانت موجبة و 11 (12.2%) عينة كانت سالبة.

أما اختبارات الجاما قلوبولين (ج) على العينات فقد أظهرت أن 16 (20%) كانت موجبة و 64 (80%) كانت سالبة.

هذه الدراسة كشفت بوضوح أهمية أجسام الغلوبيولين المناعي (ج) المضادة لحمض المايكولييك في دقته وسرعته في تشخيص السل الرئوي.

LIST OF CONTENT

Topic	Page
آية من القرآن الكريم	I
Dedication	II
Acknowledgment	III
List of Abbreviations	IV
Abstract (English)	V
Abstract (Arabic)	VI
List of content	VII
CHAPTER ONE	
Introduction, Objectives and Literature Review	
1.1 Introduction	1
1.2 Rationale	3
1.3 Objectives	3
1.3.1 General objective	3
1.3.2 Specific Objectives	3
1.4 Litration Review	4
1.4.1 <i>Mycobacterium</i>	4
1.4.1.1 Historical Background	4
1.4.1.2 Taxonomy	4
1.4.1.3 Microscopic morphology	6
1.4.4.4 Physiology and Cell Wall Structure	7
1.4.1.5 Nutritional and Environmental Requirements for Growth	8
1.4.1.6 Generation Time	10
1.4.2 Epidemiology	10
1.4.2.1 Global Epidemiology of Tuberculosis	10
1.4.2.2 World Wide Distribution of TB/HIV Co-infection	11
1.4.3 Virulence Mechanisms	12
1.4.4 Pathology	12
1.4.5 Clinical Features	13
1.4.5.1 Pulmonary Tuberculosis	13
1.4.5.2 Adult Post-Primary Pulmonary Tuberculosis	14
1.4.6 Mycolic Acids	15
1.4.7 Anti-Mycolic Acid Antibodies in Pulmonary Tuberculosis Patients	15
1.4.8 Diagnosis	16
1.4.8.1 Conventional Diagnostic Methods	16
1.4.8.2 Microscopic Techniques	16
1.4.8.3 Traditional Culture Techniques	17
1.4.8.4 Biochemical Tests and Morphological Features	18
1.4.8.5 Immunological Diagnosis	18
1.4.8.5.1 Tuberculin Test	18
1.4.8.5.2 Quantiferon-TB test	18
1.4.8.6 Molecular Diagnosis	19

1.4.9 Treatment	20
1.10 Prevention	21
1.11 Vaccines	21
CHAPTER TWO	
2. Materials and Methods	
2.1 Study Approach	23
2.2 Study Design	23
2.2.1 Type of The Study	23
2.2.2 Study Area	23
2.2.3 Study Duration	23
2.2.4 Sample Size	23
2.2.5 Study Population	23
2.2.6 Data Collection	23
2.2.7 Etical consideration	23
2.3 Asepsis and sterilization	24
2.3.1 Hot air oven	24
2.3.2 Disinfection	24
2.4 Method of samples collection	24
2.4.1 Sputum Sample	24
2.4.2 Blood Sample	24
2.5 Methods to identify <i>M. tuberculosis</i>	24
2.5.1 Zeihl Neelsen Stain	24
2.5.2 Decontamination of Sputum	25
2.5.3 Preparation of Lowenstein Jensen medium	25
2.5.4 Culture Method	26
2.6 Identification of The Isolate	26
2.6.1 Growth Rate	26
2.6.2 Pigment Production	26
2.6.3 Catalase Test	27
2.6.4 Nitrate Reduction Test	27
2.6.5 Sensitivity to Para-Nitrobenzoic Acid (PNB) 500 mg / L	27
2.6.6 Sensitivity to Thiophene-2-Carboxylic Acid Hydrozide(TCH) 5 mg / L	27
2.7 Molecular Identification (PCR)	28
2.7.1 DNA Extraction From Sputum	28
2.7.2 Primers of Insertion Sequence <i>IS6110</i>	28
2.7.3 Preparation of PCR Mixture	28
2.7.4 PCR amplification	29
2.7.5 Preparation of Agarose Gel	29
2.7.6 Visualization of PCR Product	29
2.8 Monitoring of Antimycolic Acid	30
2.8.1 Materials	30
2.8.1.1 Mycolic Acids	30
2.8.1.2 Human Sera	30
2.9 Plastic wares	30

2.10 Method for ELISA Assay	30
2.10.1 Antigen Coating of ELISA Plates	30
2.10.2 Blocking of ELISA Plates	30
2.10.3 Binding of Human Antibodies	31
2.10.4 Detection of the Bound Antibodies	31
CHAPTER THREE	
3. Results	
3.1 Bacteriological findings	32
3.1.1 Ziehl-Neelsen staining	32
3.1.2 Cultural characteristics	32
3.1.3 Biochemical tests	32
3.2 Polymerase chain reaction	32
3.2.1 Amplification of the IS6110 gene	32
3.3 Enzyme Linked Immuno-Sorbent Assay (ELISA)	33
CHAPTER FOUR	
4. Discussion, Conclusion and Recommendations	
4. Discussion	42
4.1 Conclusion	44
4.2 Recommendations	44
Reference	45
Appendices	

List of Figures

Fig, No.	Fig. Name	Page
1	Distribution of the study population according to gender	34
2	Distribution of the study population according to age	35
3	Result of ZN Stain among target population	36
4	Result of Culture on LJ medium among target population	37
5	Shows multiple scatter of anti-IgG anti-mycolic among enrolled patients	41

List of Plates

Plate No.	Plate name	Page
1	Typical colonial morphology of 3 weeks old M. tuberculosis on LJ medium showing tough, rough colonies appearance.	38
2	Products of PCR Showing DNA Band on Agrose Gel	40

List of Plates

Table No.	Table name	Page
1	The results of biochemical reaction	39

LIST OF ABBREVIATIONS

AFB	Acid Fast Bacilli
AIDS	Aquired Immuno Dificiency Syndrome
AMA	Anti Mycolic Acid Antibodies

BC	Before Century
BCG	<u>Bacillus Calmette-Guérin</u>
CDC	Center for Disease Control
CF	Cord-Factor
CR1	Complement Receptors1
CR3	Complement Receptors3
DAT	Diacyltrehalose
DNA	Deoxyribonucleic Acid
ELISA	Enzyme Linked Immuno-Sorbent Assay
G+C	Guanosine plus Cytosine
HIV	Human Immunodeficiency Virus
IgG	Immunoglobulin Gamma
IUATLD	International Union Against Tuberculosis and Lung Disease
KDa	kiloDalton
LAM	lipoarabinomannan
LJ	Löwenstein-Jensen
<i>M.tb</i>	<i>Mycobacterium tuberculosis</i>
MA	Mycolic Acids
MDR-TB	Multidrug-resistant TB
NTMs	Non-Tuberculous Mycobacteria
PCR	Polymerase Chain Reaction
PGL	Phenol glycol Lipids
PPDs	Purified Protein Derivatives
RNA	Ribonucleic Acid
TB	Tuberculosis
TDM	Trehalose dimycolates
TMM	Trehalose monomycolates
TST	Tuberculin Skin Test
WHO	World Health Organization
XDR-TB	Extensively drug-resistant