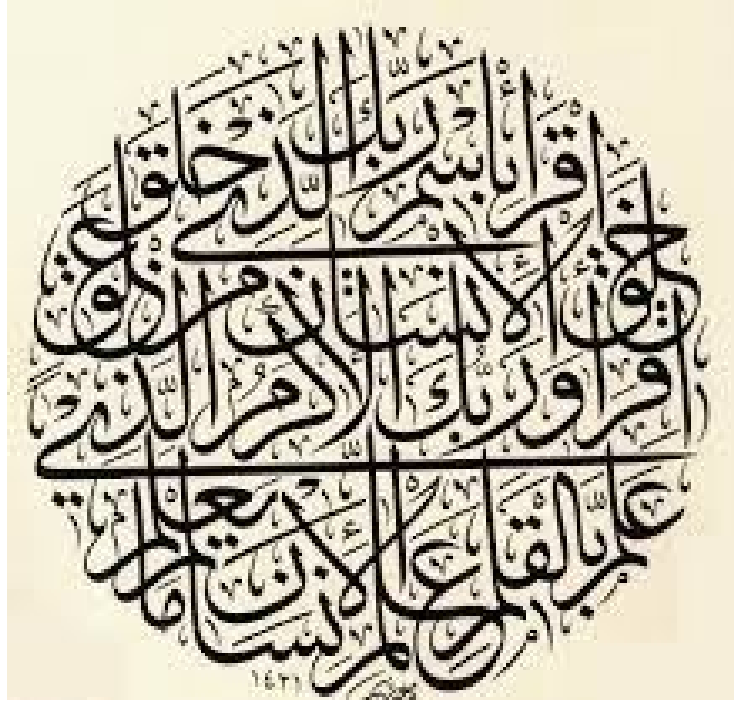


بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



صَدَقَ اللَّهُ الْعَظِيمُ

## **Dedication**

This study is dedicated to my parents and my lovely family for their unconditional support, and for all Sudanese children.

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## List of Abbreviations

<b>AFB</b>	Acid Fast Bacilli
<b>ATS</b>	American Thoracic Society
<b>BCG</b>	Bacillus Calmette-Guerin
<b>CPC</b>	Cetylpyridinium chloride
<b>CDC</b>	Centers for Disease Control
<b>DNA</b>	deoxyribonucleic acid
<b>DOTS</b>	directly observed treatment, short-course
<b>EtBr</b>	Ethidium Bromide
<b>HIV</b>	human immunodeficiency virus
<b>IFN-<math>\gamma</math></b>	interferon-gama
<b>LJ</b>	Löwenstein-Jensen
<b>LM</b>	lipomannan
<b>LAM</b>	lipoarabinomannan
<b>MDR-TB</b>	multiple drug resistance tuberculosis
<b>MTB</b>	<i>Mycobacterium tuberculosis</i>
<b>mAGP</b>	mycolylarabinogalactan-peptidoglycan
<b>NAAT</b>	Nucleic Acid Amplification Techniques
<b>NGOs</b>	non-governmental organizations
<b>NTM</b>	non-tuberculous mycobacteria
<b>PCR</b>	polymerase chain reaction
<b>PIMs</b>	phosphatidylinositol mannosides
<b>PZA</b>	pyrazinamide
<b>TB</b>	tuberculosis
<b>TST</b>	tuberculin skin test
<b>WHO</b>	World Health Organization
<b>ZN</b>	Ziehl-Neelsen

## ABSTRACT

Tuberculosis (TB) is a chronic contagious disease which has a major impact on global public health problem. This study was carried out in Khartoum state during the period from January 2011 to December 2013 to improve detection of *Mycobacterium tuberculosis* in children with symptoms of tuberculosis infection using different conventional and advanced diagnostic techniques. One hundred ninety seven specimens of gastric lavage and sputum were collected from different hospitals in Khartoum State including Elbolok Hospital, Jafar Ibn Owf Hospital, Elasha'ab Teaching Hospital, Soba University Hospital and Academiyy Charity Hospital.

All children participating in the study were subjected to mantoux test after obtaining appropriate consent injected by 5 tuberculin units of Tuberculin purified protein derivative and the results were taken after three days. Specimens were decontaminated and inoculated on Lowenstein Jensen media according to modified Pettrouf's method, Two smears were prepared and stained by Ziehl-Neelsen stain and Auramin fluorescent dye, bacterial DNA was extracted from each specimen by using phenol chloroform method, and then the Polymerase Chain Reaction technique was adopted to detect Insertion Sequence IS6110 gene of *M. tuberculosis* in these specimens. This study showed that the positive results for TST, ZN, Auramin, Culture and PCR were 86 (43.7%), 16 (8.1%), 22 (11.2%), 32

(16.2%) and 35(17.8%) respectively. The study concluded that the PCR technique is a most sensitive and specific technique for a fast identification of *M. tuberculosis* in gastric lavage and sputum from children who are unable to expectorate good quality sputum sample or diagnosed as negative using conventional diagnostic methods.

## الخلاصة

مرض الدرن مزمن ومعدى وله تأثير علي كل المجتمع الطبي في العالم. أجريت هذه الدراسة بولاية الخرطوم في الفترة من يناير 2011 الى ديسمبر 2013 للكشف عن المتقطرة السلية في الاطفال الذين يعانون من اعراض مرض الدرن بأستخدام وسائل تشخيص تقليدية ومتطورة مختلفة. مائة وسبعة وتسعين عينة من غسيل المعدة والقشع تم جمعها من مستشفيات مختلفة بولاية الخرطوم وتتضمن مستشفى البلك للاطفال ، مستشفى جعفر ابن عوف للاطفال، مستشفى الشعب التعليمي، مستشفى سوبا الجامعي و مستشفى الاكاديمي الخيري.

تم حقن جميع الاطفال المشاركين بالبحث بخمس وحدات من التيوبركلين وتم اخذ النتائج بعد ثلاثة ايام من الحقن. تمت عملية ازالة التلوث من جميع العينات ومن ثم تم تزييعها بوسط لونستن جونسن بناء على طريقة بتروف المعدلة ، تم اعداد مسحتين من كل عينة وتم صبغهما بصبغة زيل نلسون و صبغة الاورامين المتألقة، تم استخلاص الحمض النووي للجرثومة بواسطة طريقة الفينول كلوروفورم ومن ثم تم اجراء تقنية تفاعل البلمرة المتسلسل للكشف عن جين المتقطرة السلية.

أظهرت الدراسة نتائج ايجابية لفحص التيوبركلين الجلدي، صبغة زيل نيلسون، صبغة الاورامين، طريقة التزييع و تفاعل البلمرة المتسلسل بنسب كالآتي 86 (43.7%) ، 16 (8.1%) ، 22 (11.2%) ، 32 (16.2%) و 35 (17.8%) علي التوالي. خلصت الدراسة الي ان تقنية تفاعل البلمرة المتسلسل هو الاكثر حساسية وتخصصية للكشف السريع عن المتقطرة السلية بعينات غسيل المعدة والقشع من الاطفال غير القادرين علي اعطاء عينة جيدة للقشع او المشخصين بنتائج سلبية بواسطة استخدام طرق التشخيص التقليدية.