Prevalence of Pulmonary Mycobacterial Infections and their Risk Factors among Inmates of Agodi Custodial Centre Ibadan, Oyo State Nigeria

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Certification

This is to certify that **Adegoke, Olusola Andrew** with the Matriculation Number **LCU/PG/002537**, carried out this research work titled "Prevalence of Pulmonary Mycobacterial Infections and their Risk Factors among Inmates of Agodi Custodial Centre Ibadan, Oyo State" in the Department of Biological Sciences, Faculty of Natural and Applied Sciences, Lead City University Ibadan, Oyo State, for the award of Master Degree (MSc.) in Medical Microbiology and this has not been previously submitted.

Toyosi Raheem Phd (Supervisor) — **Date**

Dr. Felicia Adesina (Head of Department) — **Date**

Dedication

This project is dedicated to God Almighty, my Redeemer who created me for a specific and unique purpose.

Acknowledgement

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Even though the above-mentioned institutions and persons have assisted in the process of this research work, I alone stand responsible for the errors, if any, found in the work.

Abstract

Prison represents dynamic communities with congregation of risk factors of Mycobacterial infections, other diseases and its transmission. The study determines the prevalence of mycobacterial infections that is yet to be studied in Agodi Custodial Center, Oyo State, Nigeria. A total of two hundred (200) sputum samples were collected from the inmates who have been coughing for weeks or more between January and June, 2022. Structured Questionnaires were administered to the eligible inmates to capture bio-data and TB risk factors. National Tuberculosis and Leprosy Control Program (NTBLCP) Algorithm of test for *Mycobacterium tuberculosis* was strictly followed in addition to genetic relatedness of the isolates which was determined using Phylogenic analysis. 39.5% of the inmates tested had their average means age to be 29.5 years. Over 67.5% had secondary education as their highest educational qualification. Out of 19.5% that were positive for Gene Xpert MTB/RIF assay 10% were Rifampicin sensitive, 1.5% were Rifampicin resistant and 8.5% were Rifampicin Indeterminate. Respondent educational status (p=0.000), HIV status (p=0.000), those with cough for two or more weeks (p=0.008) and those previously treated for TB (p=0.002) respectively were statistically significantly associated with mycobacterial infection. Culture result captured the overall prevalence of mycobacterial infections in Agodi prisons to be 21%. Out of this *Mycobacterium tuberculosis* was 10%, *Mycobacterium bovis* was 5%, Non-Tuberculous Mycobacterium (NTM) was 6% *Mycobacterium fortuitum* dominated among the NTM, *Mycobacterium chelonie* in lesser percentage .The overall anti-TB resistance was found to be 11.5% with Rifampicin resistance 70.0% and 76.6% by LPA (molecular) phenotypic proportion method respectively. The study show that the prevalence of mycobacterial infection with concomitant drug resistance is high among the inmates at Agodi Custodial Center with overcrowding as the most associated factor. Therefore, prison decongestion, architectural design and infection control measures are recommended to stop the high rate of mycobacterial infections.

Key words: Mycobacterial infection, Prison inmates, Tuberculosis, Risk factors, Rifampicin Resistant.

Word Count: 300

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Chapter Two: Literature Review

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Abbreviations	Meaning
ADA	Adenosine Deaminase
AFB	Acid fast Bacilli
AIDS	Acquired Immunodeficiency Syndrome
AMLSCN	Associate Medical Laboratory Science Council of Nigeria
ART	Anti- Retroviral Therapy
ATP	Adenosine Triphosphate
B.C	Before Christ
BACTEC	Becton, Dickinson and Company Technology
BCG	Bacillus Calmette Guerine
BMI	Body Mass Index
BSC	Biosafety Cabinet
C	Control
CDC	Center for Disease Control
CNR	Case Notification Rate
CO_2	Carbon dioxide
CSF:	Cerebro Spinal Fluid
CTP	Committee for the Prevention of Torture
DNA	Deoxyribonucleic Acid
DOTs	Directly Observed Treatment Short-course
DRC	Democratic Republic Congo
DST	Drug Susceptibility Testing

DT or DP	Degrading Treatment or Punishment
EDTA	Ethylene Di-amine Tetra acetic Acid
EMB	Ethambutol
EPTB	Extra pulmonary Tuberculosis
ESTC	European Standard for Tuberculosis Care
FDA	Food and Drug Administration
FL	First Line
FMLSCN	Fellow Medical Laboratory Science Council of Nigeria
FMOH	Federal Ministry of Health
GAT	Gartifloxacin
HBCs	High burden countries
HIV	Human Immunodeficiency Virus
ICCPR	International Covenant on Civil and Political Rights
ICESCR	International Covenant on Economic, Social and Cultural Rights
IGRA	interferon-gamma release assay
IJPH	International Journal of Public Health
INH	Isoniazid
ITS	Information Technology Solution
IUATLD	International Union Against Tuberculosis and Leprosy Disease
IUATLD;	International Union Against Tuberculosis and Leprosy Disease
LJ	Lowenstein Jensen
LPA	Line Probe Assay
MB	Middle Brook

MDG	Millennial Developmental Goal
MDR-TB	Multidrug Resistant Tuberculosis
MGIT	Mycobacterial Growth Indicator Tube
MGW	Molecular Grade Water
MODS	Microscopic Observation of Drug Ssceptibility
MSc.	Master of Science
MTB/RIF	Mycobacterium/Rifampicin
MTBC	Myco-Tuberculous complex
NAAT	Nucleic Acid Amplification Test
NAD	Nicotinamide Adenine Dinucleotide
NALC	N-Acetyl L-Cysteine
NaOH	Sodium Hydroxide
NCBI	National Center for Biotechnology Information
NGO	Non Governmental Organization
NIMR	Nigerian Institute of Medical Research
NRA	Nitrate reductase Assay
NTM	Non Tuberculous Mycobacteria
OADC	Oleic Acid-Albumin-Dextrose-Catalase
PCR	Polymerase Chain Reaction
PH	Puissan de Hydrogen
PLHIV	People Living with Human Immuno-deficiency Virus
PPD	Purified Protein Derivative
PRISMA	Preferred reporting Items for Systematic Reviews and Meta-Analysis

PSQ	PyrosequencingDegrading Treatment or Punishment
PTB	Pulmonary tuberculosis
PZA	Pyrazinamide
RA	Registered Associate
RNA	Ribonucleic Acid
RR-TB	Rifampicin Resistant Tuberculosis
S	Streptomycin
SARS	Severe Acute Respiratory Syndrome
SDG	Social Developmental Goal
SL	Second Line
SPSS	Statistical Package for Social Sciences
SSA	Sub Saharan Africa
TB	Tuberculosis
TST	Tuberculin Skin Testing
UCH	University college hospital
UHC	Universal Health Coverage
UHC:	Universal Health Coverage
USA	United State of America
WHO	World health organization
XDR-TB	Extensively Drug Resistant Tuberculosis
XXDR-TB	Extremely Drug Resistant Tuberculosis