

## PREVALENCE OF MYCOBACTERIUM TUBERCULOSIS AMONG HIV-POSITIVE PATIENTS AGED 12-60 YEARS ATTENDING ART CLINIC AT CMRC HC IV MUBENDE DISTRICT. A CROSS-SECTIONAL STUDY.

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Page | 1

### ABSTRACT

#### Background

Tuberculosis (TB) infection is the leading co-infection among HIV/Aids patients in the world. The objective of the study will be to determine the prevalence and risk factors of tuberculosis among clients attending ART and OPD clinics at CMRC HC IV.

#### Methodology

A cross-sectional study was carried out within a period of one month where any HIV-positive client from 12-60 years presenting with cough for more than 3 days was included in the study. The results were obtained by microscopic examination of ZN-stained smears for red rods or bacilli.

#### Results

The prevalence of participants was 80 (70.8%) and 33 (29.2%) were negative, 48 (60%) male patients had developed active TB infection. 58 (72.5%) of the TB patients had positive acid-fast bacilli, 22 (27.5%) had positive Gene Expert, and 29 (36.3%) of the TB clients were between 26 and 35 years. Catholics had the highest prevalence of 27 (33.7%). Most of the TB cases were among Single clients 45 (56.3%), clients with a primary level of education, and those who never attended school at a prevalence of 21 (26.3%) and 35 (43.7%) respectively. Also, the non-formal employed had a higher prevalence of 47 (58.8%) and the majority of the TB patients had a pulmonary TB infection

#### Conclusion

The prevalence of tuberculosis infection among HIV clients at CMRC H/C IV Mubende District was high. Laboratory diagnosis of TB by Smear microscopy provided the least positive TB cases compared to other methods.

#### Recommendation

Clinicians and other health service providers to intensify early screening of HIV-positive clients for tuberculosis and initiation of TB preventive therapy particularly for patients with advanced WHO clinical stage. Multiple laboratory diagnostic methods should be employed in addition to smear microscopy to minimize delayed diagnosis and treatment.

**Keywords:** Prevalence, Mycobacteria Tuberculosis, HIV positive patients, ART Clinic

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### BACKGROUND

Tuberculosis (TB) infection is the leading co-infection among HIV/Aids patients in the world. Approximately 43.8 million people live with HIV globally, 24.4 million in east and southern Africa, and 1.4 million in Uganda (UNAIDS 2022). More than 4100 people die from tuberculosis (TB) every day and approximately 30,000 people fall ill with TB disease despite TB being preventable and treatable (UNAIDS, 2022). TB is the leading cause of death among people living with HIV (PLHIV) where in 2020; it was ranked 13th leading cause of death after COVID-19 and above HIV/AIDS. A total of 1.5 million people died from

TB including 214,000 people living with HIV Worldwide (WHO: Global TB Report 2020). Throughout sub-Saharan Africa, the dramatic spread of the HIV epidemic has been accompanied by up to a fourfold increase in the number of TB cases registered by national TB programs (UNAIDS, 2022). Globally a quarter of a million die of TB and 30% of deaths among PLHIV in Uganda are due to TB (Gunda *et al.*, (2018).

Uganda is among the 30 highly burdened countries for TBHIV co-infection with the risk of developing TB being 20 times greater in people living with HIV (PLHIV) according to the World Health Organisation Global TB

Report (WHO, 2020). TB is a leading opportunistic infection (OI) in PLHIV in Uganda. The TB incidence rate is 196 per 100,000 per year 16 per 100,000 HIV-negative people die per year and 90,000 incidents are TB cases (Bolton L, et al; 2022). The advent of antiretroviral therapy (ART) and TB preventive therapy (TPT) has generally reduced the development of TB illness among PLHIV, as reflected by an overall reduction of HIV/AIDS-related morbidity and mortality thus improving the survival among PLHA. HIV infection is the most important risk factor for developing active tuberculosis, which increases the susceptibility to primary infection or reinfection and also the risk of tuberculosis (TB) reactivation for patients with latent TB (WHO, 2020) however mal-nutrition, diabetes, or tobacco also increases the risk of developing TB in PLHIV (WHO, 2020) (WHO: Global TB Report 2020). With the above innervations, the occurrence of TB has been reduced by 67–80% in most studies. Even with these advantages of antiretroviral therapy (ART) and TB preventive therapy (TPT), still, a significant proportion of patients on ART develop active TB with a varying prevalence rate of 2.5–30.1% in most studies (WHO Global TB Report, 2020). In Uganda, the HIV/AIDS epidemic has been accompanied by a severe epidemic of tuberculosis. Available data suggests that this increase in TB infection rate is mainly a result of the burden of HIV infection primarily because HIV induces immune suppression. HIV is the most patient risk factor for the progression of TB infection to acute disease (Mulugeta *et al.*, (2021). Individuals infected with tuberculosis alone have an approximately 10% lifetime risk of developing acute TB compared to a 10% annual risk among HIV-infected patients with a lifetime risk of developing TB which approaches 50% or more among them (Muttamba *et al.*,(2019).

However, according to records from the CMRC H/C IV the number of referrals due to tuberculosis is increasing and it has been recognized to be among the leading causes of referral for further management. Even though different studies have been conducted on HIV-TB co-infection in Uganda information on the magnitude and spectrum of pulmonary tuberculosis is still scarce in the area and thus, the purpose of this study was to determine the prevalence and risk factors of *Mycobacterium tuberculosis* infection among HIV positive clients attending Art Clinic at CMRC HC IV in Mubende District

## METHODOLOGY

### The study design

The study was a health center-based cross-sectional and experimental study that targeted HIV/AIDS patients from 12 to 60 years old receiving treatment at the ART clinic at CMRC Health Centre IV Mubende District.

### Study setting

CMRC HC IV is found in Kasenyi-Caltex LCI, Kasenyi ward, West Division, Mubende municipality, Mubende district, in Uganda. It is a UPDF health unit under UPDF-CMS and it is also supported by GOU. It has a total bed capacity of 27 beds with 25 staff working in different departments in the facility. It offers services like patient care and treatment, patients, antenatal care, maternity care, HIV/AIDS treatment and care, immunization services, TB testing and care, and laboratory services.

### Study population

The study was to target all HIV-positive patients between the age of 12-60 years old who complained of cough for more than three days to the clinician attending to them in the ART clinic and at the OPD clinic at CMRC HC IV Mubende District.

#### Sample Size

This was to be calculated using Kish and Leslie's formula (1965) that is;

$$n = \frac{t^2 P (1-P)}{d^2}$$

Where; n Minimum sample size required.

t standard normal deviate set at 95%

Confidence level =1.96

P= Estimated prevalence=8% (URC report 2019Mubende District)

d= Desired precision e.g. 5% allowed error

$$n = \frac{1.9622^2 * 0.08 (1-0.08)}{0.05^2}$$

$$n = \frac{3.8416 * 0.08 (0.92)}{0.0025}$$

$$n = \frac{0.28274176}{0.0025}$$

$$n = 113.09$$

$$n = 113$$

$$n = 113$$

$$n = 113$$

$$n = 113$$

Therefore, 113 HIV-positive patients were recruited for the study

### Sampling method

A convenient sampling method was used during sampling. This is because the technique is easy to administer, eliminates bias, and offers equal chances of selection of all members.

### Inclusion

All HIV-positive clients who were complaining of cough for more than three weeks, aged from 12-60 years, and were consented.

### Exclusion

Patients with a history of tuberculosis treatment in the last six months.

Laboratory Procedures and Analysis

### **Sputum Collection and Handling**

The 113-sputum sample was to be collected in sterilized wide-mouthed plastic containers and transported to the laboratory using a cold box. The sputum samples will be labeled with information about age, sex, and unique number before transportation to the laboratory.

### **Laboratory Diagnosis of Mycobacterium Tuberculosis**

All participants or patients in the ART clinic were tested for mycobacterium tuberculosis using ZN techniques following the standard operating procedures of the facility.

### **Data Collection**

Quantitative data was collected which included demographic information (age, sex, etc.), HIV-related data (CD4 count, viral load), Tuberculosis-related data (symptoms, history), and previous tuberculosis treatment. Qualitative data was also conducted such as interviews or focus groups to explore patient perspectives on TB/HIV co-infection.

#### **Data Management and Analysis**

Data from the questionnaire and laboratory results was to be directly recorded in books and then entered into a Microsoft Excel datasheet. Data analysis will be done using SSPS version 17.0. Characteristics such as residence, age,

employment, and education level will be summarized as percentages.

### **Data Collection Tools**

The questionnaire was to be used to collect demographic factors such as age, sex, and marital status from the respondents. Prevalence was to be determined by collecting and testing sputum samples from respondents for Mycobacterium tuberculosis infection, then entering the information into the lab register and then on the data collection sheet.

### **Ethical Consideration**

Their research proposal was to be approved by the Faculty of Health Science, University of Kisubi. An introductory letter from the Faculty of Health Science issued by the dean was to be used to introduce the researcher to the administration of CMRC Health Center IV, Mubende District.

The purpose of the study was to be explained to the participants and consent sought for them or their caretakers. Information obtained from the study was to be kept with strict confidentiality.

## **RESULTS**

### **Prevalence of Mycobacterium tuberculosis infection among HIV-positive patients**

**Table 1. showing the prevalence of Mycobacterium tuberculosis among the study respondents**

| Variables                         |                       | Frequency<br>N=113 | Confirmed<br>TB cases | Prevalence<br>of TB % |
|-----------------------------------|-----------------------|--------------------|-----------------------|-----------------------|
| <b>Age</b>                        | 12-18                 | 19(16.8%)          | 5                     | 6.1                   |
|                                   | 19-25                 | 28(24.7%)          | 20                    | 25                    |
|                                   | 26-35                 | 35(39.9%)          | 29                    | 36.3                  |
|                                   | 36-45                 | 18(15.9%)          | 15                    | 18.8                  |
|                                   | 46-55                 | 9(7.9%)            | 7                     | 8.8                   |
|                                   | 56-60                 | 4(5.3%)            | 4                     | 5                     |
| <b>Gender</b>                     | Male                  | 52(46%)            | 48                    | 60                    |
|                                   | Female                | 61(53.9%)          | 32                    | 40                    |
| <b>Religion</b>                   | Catholic              | 36(31.8%)          | 27                    | 33.7                  |
|                                   | Protestant            | 28(24.7%)          | 21                    | 26.3                  |
|                                   | Muslim                | 19(16.8%)          | 14                    | 17.5                  |
|                                   | Others                | 30(26.5%)          | 18                    | 22.5                  |
| <b>Marital status</b>             | Married               | 56(49.5%)          | 35                    | 43.7                  |
|                                   | Single                | 48(42.5%)          | 45                    | 56.3                  |
|                                   | Divorced              | 9(8.0%)            | 0                     | 0                     |
| <b>Education level</b>            | Primary               | 33(29.2%)          | 21                    | 26.3                  |
|                                   | Secondary             | 19(16.8%)          | 14                    | 17.5                  |
|                                   | Tertiary / university | 16(14.2%)          | 10                    | 12.5                  |
|                                   | Never attended school | 45(39.8%)          | 35                    | 43.7                  |
| <b>Occupational</b>               | Formal employed       | 20(17.7%)          | 14                    | 17.5                  |
|                                   | Un formal employed    | 68(60.2%)          | 47                    | 58.8                  |
|                                   | School going          | 25(22.1%)          | 19                    | 23.7                  |
| <b>Laboratory testing methods</b> | Smear microscopy /ZN  | 76(67.2%)          | 58                    | 72.5                  |
|                                   | Gene expert           | 37(32.7%)          | 22                    | 27.5                  |

The prevalence of the total of 113 HIV-positive clients who participated in the study was 80 (70.8%) and 33 (29.2%) were negative, 48 (60%) male and 32 (40%) female respectively of the patients had developed active TB infection. 58 (72.5%) of the TB patients had positive acid-fast bacilli (AFB), 22 (27.5%) had positive Gene Expert, 29 (36.3%) of the TB clients were between 26 and 35 years, followed by 19-25 years were 20 (25%), and then 36 to 45 years were 15 (18.8%) prevalence of TB infection. Age groups of 12-18 and 56-60 years had the least prevalence. Catholics had the highest prevalence of 27 (33.7%), followed by the Protestants at 21 (26.3%). Most of the TB

cases were among Single clients 45 (56.3%), clients with a primary level of education, and those who never attended school at a prevalence of 21 (26.3%) and 35 (43.7%) respectively. Also, the non-formal employed had a higher prevalence of 47 (58.8%) and the majority of the TB patients had a pulmonary TB infection as shown in Table 1.

### **Factors contributing to the prevalence of mycobacterium tuberculosis infection among HIV-positive clients**

**Table 2. Prevalence of risk factors of Mycobacterium Tuberculosis**

| Risk factors                             |                | Number / %<br>(n=113) | Confirmed TB cases<br>Negative | Confirmed TB cases<br>Positive |
|------------------------------------------|----------------|-----------------------|--------------------------------|--------------------------------|
| Number of people in the room             | 1              | 27(24%)               | 19                             | 8                              |
|                                          | 2              | 36(32%)               | 24                             | 12                             |
|                                          | More           | 50(44.2%)             | 36                             | 14                             |
| Living with someone with a chronic cough | Yes            | 36(31.8%)             | 30                             | 6                              |
|                                          | No             | 77(68.1%)             | 76                             | 1                              |
| Smoking cigarettes                       | Yes            | 51(45.1%)             | 42                             | 9                              |
|                                          | No             | 62(54.8%)             | 62                             | 0                              |
| Adherence to ART                         | Yes            | 91(80.5%)             | 90                             | 1                              |
|                                          | No             | 22(19.5%)             | 14                             | 8                              |
| Nutritional Status                       | Poor           | 90(79.6%)             | 79                             | 11                             |
|                                          | Good           | 23((20%)              | 20                             | 3                              |
| TB Preventive Therapy (TPT) status       | Non-use of TPT | 18(16.0%)             | 13                             | 5                              |
|                                          | Completed TPT  | 95(84%)               | 93                             | 2                              |

In Table 2, 113 clients were examined and interviewed to determine the factors leading to the development of active TB among HIV-positive clients receiving ART. The various factors were as follows; Number of people living more than 2 in a room tested positive have the highest TB infection where 14 (28%). The number of positive cases among Smoking cigarettes where 9 (17.6%). Living with someone with chronic cough were 6 (16.7%). Adherence to ART was 1 (1.1%), and TB Preventive Therapy (TPT) status was 2 (2.2%).

## DISCUSSIONS

### Factors contributing to the prevalence of mycobacterium tuberculosis infection among HIV-positive clients

In the study, male clients were found to have a high risk of developing TB at 48 (60%) whereas female clients were at 32 (40%) of developing TB. Several studies had similar findings including the study conducted by (Muttuba. W *et al*; 2019) in the five referral hospitals of Uganda to assess the prevalence and risk factors of TB with the risk of developing TB in males being at 23%. Clients with low levels of education were at a 45.4% risk of developing TB compared to those with higher levels of education with a 37.5% risk of developing TB. This agrees with the study conducted by (Tegegne AS *et al*;2022) with the risk of developing TB is higher in clients with low levels of education than in those with a higher level of education. Also, the risk of developing TB was high in peasant farmers (non-formal employed) at 58.8%and least in clients with

formal employment at 17.5% non-formal employed and school going were 20 times at risk compared to those with formal education due to high poverty levels and were less informed. This agrees with the study conducted by (Muttuba. W *et al* 2019). In this study, the risk of developing TB was higher in contacts of TB patients and clients who use alcohol than those who smoke cigarettes. Contacts of TB patients at risk of developing TB and non-users of alcohol at risk of developing TB whereas non-smokers were 15 times at risk of developing compared to smokers. These findings agree with the study conducted by (Muttuba. W *et al*; 2019) and disagree with the risk in smokers. In the study conducted by (Muttuba. W *et al*; 2019), the risk of developing TB in smokers was 19.9% in this study the risk was 0% this is due to the few number of smokers registered in the study.

### Prevalence of Mycobacterium tuberculosis infection among HIV-positive patients

The prevalence of developing TB infection while receiving ART was found to be 48 (60%) and 32 (40%) female and male respectively. The number of infected male patients outweighed female patients. The prevalence is relatively in agreement with a similar previous study conducted by (Mulugeta. Tet *al*;2021) found the prevalence of TB among people living with HIV in southwest Ethiopia to be at 17.3%. It disagrees with findings of similar studies such as the study conducted by (Daniel W. Gunda *et al*;2018) in Northwest Tanzania which indicated the prevalence of active TB among HIV clients receiving ART to be at 11%, in another study conducted by (Kavitha. G *et al*; 2023) in four African

countries indicated the prevalence of TB is 3% among people living with HIV and in the study conducted in Bududa among people receiving ART by (Kalyetsi. R *et al*;2019) found the prevalence of TB among HIV-positive clients to be at 5.9%.

The majority, (58) 72.5% of the participants were diagnosed using smear microscopy (Zn) and clients were diagnosed with gene expert with 22 (27.5%) positive cases, The low positivity rate in smear microscopy was responsible for the low prevalence rate which was observed in most studies that were solely based on it such as the study conducted by (Kavitha. G *et al*; 2023) in four African countries indicated the prevalence of TB was 3% among people living with HIV and in the study conducted in Bududa among people receiving ART by (Kalyetsi. R *et al*; 2019) found that the prevalence of TB among HIV-positive clients was 5.9% since it's the cheapest and most commonly used method to diagnose TB.

The development of TB among HIV-positive clients was proportional to age the most affected age group was 26-35 years with a prevalence of 29 (36.3%), followed by 19-25 years with a prevalence of 20 (25%) than by those of 36 - 45 years with a prevalence of 15 (18.8%). The highest TB cases were recorded in the age group of 26-35 years which agrees with the study conducted by (Daniel W. Gunda *et al*; 2018) but in disagreement with the studies conducted by (Kavitha *et al*; 2023), (Mulugeta T, *et al*; 2021) and (Kalyetsi *et al*; 2019) in which the highest cases of TB were registered in the age group of 25-39 years.

In this study, male clients had the highest prevalence of TB at 60% than females at 40%. These findings agree with the previous studies conducted by (Daniel W. Gunda *et al*; 2018) (male 55.81%, female 44.19%) and (Kavitha *et al*; 2023) (male 53.8%, Female 44.19%), which indicated a higher prevalence of TB among males than females and disagreed with the study conducted by (Kalyetsi *et al*; 2019) (male 3.23%, female 8.06%) with higher prevalence recorded in females than in males. However, the rate of developing TB is independent of age and sex.

### Conclusions

The prevalence of tuberculosis infection among HIV clients at CMRC H/C IV Mubende District was high. The TB prevalence was higher in male clients compared to females, with a median age of 30 years. Laboratory diagnosis of TB by Smear microscopy provided the least positive TB cases compared to other methods.

### Recommendations

Clinicians and other health service providers to intensify early screening of HIV-positive clients for tuberculosis and initiation of TB preventive therapy particularly for patients with advanced WHO clinical stage. Multiple laboratory diagnostic methods should be employed in addition to smear

microscopy to minimize delayed diagnosis and treatment. The Ministry of Health should think of bolstering and reducing the treatment period of TB infection to reduce treatment fatigue.

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### ABBREVIATIONS

|        |                                              |
|--------|----------------------------------------------|
| TB     | Tuberculosis                                 |
| HCIV   | Health Center Four                           |
| ZN     | Ziehl Nelsen                                 |
| MTB    | Mycobacterium Tuberculosis                   |
| WHO    | World Health Organization                    |
| HIV    | Human Immunodeficiency Virus                 |
| AIDS   | Acquired Immunodeficiency Syndrome           |
| ART    | Antiretroviral Therapy                       |
| AFB    | Acid Fast Bacilli                            |
| OPD    | Outpatient Department                        |
| PCR    | Polymerase Chain Reaction                    |
| CMRC   | Chieftaincy of Mubende Rehabilitation Centre |
| UPDF   | Uganda Peoples' Defense Forces               |
| UNAIDS | Joint United Nations Programme on HIV/AIDS   |
| PLHIV  | People Living With HIV                       |
| OI     | Opportunistic Infection                      |
| TPT    | TB Preventive Therapy                        |
| GOU    | Government of Uganda                         |
| CMS    | Chieftaincy of Medical Services              |

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### Conflict of interest

No conflict of interest declared



### Author Biography

Onegi Peter Rubanga W is a final year student of Diploma in Medical Laboratory Technology at the University of Kisubi

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Page | 7

### REFERENCES

1. Ganesan K, Mwesigwa R, Dear N, Esber AL, Reed D, Kibuuka H, Iroezindu M, Bateman E, Owuoth J, Singoei V, Maswai J, Parikh AP, Crowell TA, Ake JA, Polyak CS, Shah N, Cavanaugh JS; AFRICOS Study Group; AFRICOS Study Group. Epidemiology of Tuberculosis Among People Living With HIV in the African Cohort Study From 2013 to 2021. *J Acquir Immune Defic Syndr*. 2023 Apr 15;92(5):359-369. doi: 10.1097/QAI.0000000000003152. Epub 2023 Jan 3. PMID: 36728618; PMCID: PMC9988234.
2. Gunda, D. W., Maganga, S. C., Nkandala, I., Kilonzo, S. B., Mpondo, B. C., Shao, E. R., & Kalluvya, S. E. (2018). Prevalence and risk factors of active TB among adult HIV patients receiving ART in northwestern Tanzania: a retrospective cohort study. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2018.
3. Mulugeta, T., Takale, A., Umeta, B., & Terefe, B. (2021). Active TB infection and its associated factors among HIV-1 infected patients at Jimma Medical Center, Southwest Ethiopia. *Journal of Pharmaceutical Health Care and Sciences*, 7, 1-7.
4. Muttamba, W., Kirenga, B., Ssengooba, W., Sekibira, R., Katamba, A., & Joloba, M. L. (2019). Prevalence of tuberculosis risk factors among bacteriologically negative and bacteriologically confirmed tuberculosis patients from five regional referral hospitals in Uganda. *The American Journal of Tropical Medicine and Hygiene*, 100(2), 386.
5. Obeagu, E. I., & Onuoha, E. C. (2023). Tuberculosis among HIV Patients: A review of Prevalence and Associated Factors. *Int. J. Adv. Res. Biol. Sci*, 10(9), 128-34.
6. Rogers, K., Gertrude, N., & Enoch, M. (2019). Pulmonary Tuberculosis in HIV/AIDS Patients Attending Art Clinic in Bududa General Hospital, Bududa District, Uganda.
7. Tegegne AS, Minwagaw MT. Risk Factors for the Development of Tuberculosis Among HIV-Positive Adults Under Highly Active Antiretroviral Therapy at Government Hospitals in Amhara Region, Ethiopia. *Int J Gen Med*. 2022 Mar 15;15:3031-3041. doi: 10.2147/IJGM.S358517. PMID: 35313549; PMCID: PMC8934160.
8. UNAIDS (2022). FACT SHEET — WORLD TUBERCULOSIS DAY 2022. UNAIDS Global TB Statistics, (2022). <https://www.unaids.org/en/resources/fact-sheet>
9. WHO (2020). GLOBAL TUBERCULOSIS REPORT 2020. World Health Organization, (2020). [https://doi.org/ISBN\\_978-92-4-001313-1](https://doi.org/ISBN_978-92-4-001313-1) (electronic version) ISBN 978-92-4-001314-8 (print version) (2020). <https://www.who.int/publications/i/item/9789240013131>.

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