Incidence of Tuberculosis in HIV Sero-positive Patients at HIV Clinic at Kampala International University Teaching Hospital, Bushenyi District

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ABSTRACT

This study on the prevalence of TB among HIV sero-positive was carried at the HIV CLINIC of Kampala International University Teaching Hospital (KIUTH), Ishaka Bushenyi district. A retrospective cross-sectional study design was used to conduct this research. The study targeted all patients attending KIUTH HIV/TB clinic. A standard structured and semi-structured questionnaires were designed and pre-tested for validity and reliability at Kampala International University Teaching Hospital HIV/Tuberculosis clinic before being used for data collection. Data collection started by recruitment of qualified research assistants, appropriate training and orientation of the interviewers before the survey for example when reading the questions. Quantitative methods of data analysis was used in which data was presented in form of bar charts, graphs and tables. The prevalence of TB among HIV sero-positive patients attending HIV clinic at KIUTH stands at 8.06 per 100 participants. The study found that generally, people are aware about the modes of transmission of TB but there is still need for more awareness. Many patients are still not certain whether TB is curable in HIV patients. As seen from the above study, most of the people are not yet aware whether HIV goes hand in hand with tuberculosis. The prevalence of TB in HIV sero-positive attending HIV clinic at KIUTH is high. Generally, TB is affecting patients of all ages and most patients are still not aware if TB in HIV is curable. Most patients have a perception that all TB patients have HIV. Health workers in HIV clinic of KIU-TH should teach patients the modes of transmission and prevention of TB. KIUTH also need to provide easy access to TB screening services to patients. There is need for financial support by the government to the unemployed patients and low-income earners in order to curb TB infections.
Keywords: Tuberculosis, HIV, Sero-positive, Bushenyi District

INTRODUCTION

According to World Health Organization (WHO), tuberculosis (TB) is an infectious disease of humans and animals caused by a species of *Mycobacterium*, usually *Mycobacterium tuberculosis*, mainly infecting the lungs where it causes tubercles characterized by the expectoration of mucus and sputum, fever, weight loss, and chest pain, and transmitted through inhalation or ingestion of the bacteria [1]. It is the most common cause of infectious disease-related mortality worldwide [2-16].
Mycobacteria such as *Mycobacteria tuberculosis* are aerobic, non-spore forming, non-motile facultative, curved intracellular rods measuring 0.2-0.5 micrometer by 2-4 micrometer. Their cell walls contain the mycolic, acid-rich long chain glycolipids and phospholipoglycans (mycolides) that protect mycobacteria from cell lysosomal attack and also retain red basic fuchsin dye after acid rinsing-acid fast stain [17- 30].

According to Centers for Disease Control and prevention (CDC), globally more than 1 in 3 individuals are infected with TB [31]. According to WHO, there were 8.8 million incident cases of TB worldwide in 2010, with 1.1 million deaths from TB among HIV

sero-negative persons and an additional 0.35 million deaths from HIV-associated TB.

In Uganda the World Health Organization (WHO) estimates of TB mortality, prevalence and incidence rates in the country have declined from 50, 492 and 624 per 100,000 population in 1990 to 13, 175 and 179 respectively per 100,000 population in 2012 [32]. However, an accurate estimate of TB prevalence or mortality is not available due to weaknesses in surveillance and vital registration limiting the certainty of firm conclusions.

Because of the ability of the *Mycobacterium tuberculosis* to survive and proliferate within the mononuclear phagocytes, which ingest the bacterium, *Mycobacterium tuberculosis* is able to invade the local lymph nodes and spread to the extra-pulmonary sites causing TB meningitis, TB adenitis, spinal TB, gonadal TB, gastrointestinal TB, etc [17-33-48].

Risk factors of tuberculosis include alcoholism, diabetes mellitus (DM), Human Immunodeficiency Virus (HIV) infection, age below 5 years, immunosuppressive therapy [49]. According to Slama et al. [50] who conducted a study in china, smoking is one of the risk factors and Smokers who develop TB should be encouraged to stop smoking to decrease the risk of relapse.

TB and HIV co-infection is when people have both HIV infection and also either latent or active TB disease [51]. According to the same document, TB is a serious health threat, especially for people living with HIV (PLHIV), and is the leading cause of death among PLHIV. Someone with latent TB infection and HIV infection is much more likely to develop TB disease during his or her lifetime than someone without HIV infection since the immune system is already weakened, and without treatment, TB disease can progress from sickness to death. According to WHO [1], the risk of developing TB is estimated to be between 26 and 31 times greater in PLHIV than among those without HIV infection. Globally, 14.8% of HIV patients have TB co-infection. In 2014, there were 9.6 million new cases of TB of which 1.2 million were among PLHIV. TB remains the most common cause of death in patients with AIDS [52]. Increasing data demonstrates that antiretroviral therapy (ART) is effective in reducing the risk of TB in HIV sero-positive persons [53], according to the same study done in Haiti by Juste et al. [53] starting ART at CD4 count of 200-350 microliter compared with waiting until the CD4 count is below 200 cells per micro liter reduced the risk of active TB by 50%.

METHODOLOGY

Study design
A retrospective cross-sectional study design was used to conduct this proposed study.

Study area
The study took place in Kampala International University Teaching Hospital (KIUTH) HIV/Tuberculosis Clinic - Ishaka-Bushenyi.

Selection of study population
The study targeted all patients attending KIUTH HIV/TB clinic.

Exclusion and inclusion criteria
Inclusion criteria
All patients 15 years of age and above diagnosed with HIV attending KIUTH HIV/TB clinic

Exclusion criteria
All patients below 15 years of age diagnosed with HIV and patients above 15 years of age without HIV attending KIUTH HIV/TB clinic.

Determination of sample size
The sample size was determined using Krejcie & Morgan Sample Size Formula for Finite Population:

$$s = \frac{X^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

Where:
s = required sample size.
X = the value on the table value for 1 degree of freedom at the desired confidence level
(1.96 for a 95% confidence level).

N = the population size (75-80 patients in a month).

P = the population proportion (assumed to be 50% since this would provide the maximum sample size).

d = the error margin (0.05).

On substitution of the values in the above formula,

$$S= \frac{(1.96)^2(80)(0.5)(1-0.5)}{(0.05)^2(80-1) + (1.96)^2(0.5)(1-0.5)}.$$

S=66 participants.

Therefore about 66 patients were to participate in this exercise but only 62 were considered because of limited time and financial constraints

Sampling technique
The study employed purposive sampling technique. This is where patients attending KIUTH HIV/TB clinic answered the questions during the first time of the study. The technique was to give each member of the target population an equal and independent chance of being selected for the study. This ensured that the selected sample is a good representative of the whole population.

Data collection method
A standard structured and semi-structured questionnaire was designed and pre-tested for validity and reliability at Kampala International University Teaching Hospital HIV/Tuberculosis clinic before being used for data collection. Respondent bias and researcher bias was checked by comparing data with the one summarized in the literature review, documented in chapter two.

Proofing and Data analysis
All data collections were reviewed at two levels prior to data entry into the research database and upon entry prior to analysis. The data collection and entry process is planned in such a way that all data collection sheets completed in a day were reviewed and entered on the same day.

Data was analyzed using Microsoft excel spread sheet and information summarized in the form of graphs, tables and pie-charts to give descriptive statistics as per the theme of the study.

Ethical considerations
Patients were included in the study upon giving informed consent for participation. The study was carried out only after approval by the Research Committee School of Allied Health Sciences Kampala International University- Western Campus.

RESULTS
Table 1: Age Distribution of the respondents.   (n=62)

AGE (YEARS)	FREQUENCY	PERCENTAGE (%)
15-20	03	4.80
21-25	06	9.70
26-30	08	13.0
31-35	06	9.60
36-40	18	29.0
41-45	03	4.80
46-50	09	14.5
51-55	09	14.5
TOTAL	62	100

The majority of the respondents 18 out of 62 (29.0%) were between 36-40 years. The youngest respondent was 20 years and the oldest respondent was 53 years.

Table 2: Gender of the respondents. (n=62)

GENDER	FREQUENCY	PERCENTAGE (%)
MALE (M)	28	45.2
FEMALE (F)	34	54.8
TOTAL	62	100

The number of males who participated in the study were 28 (45.2%) and 34 (54.8%) were females. There was almost equal representation of both sexes.

Table 3: Education Level of the Respondents.   (n=62)

EDUCATION LEVEL	FREQUENCY	PERCENTAGE (%)
No Formal Education	13	21.0
Primary Education	31	50.0
Secondary Education	12	19.3
Tertiary& university	06	09.7
TOTAL	62	100

Out of the 62 respondents that were interviewed, thirty-one (50%) had attained primary Education, 13 (21%) had no formal education, another 12(19. %) had attained secondary education and 06(09.7%) participants had attained tertiary& university education.
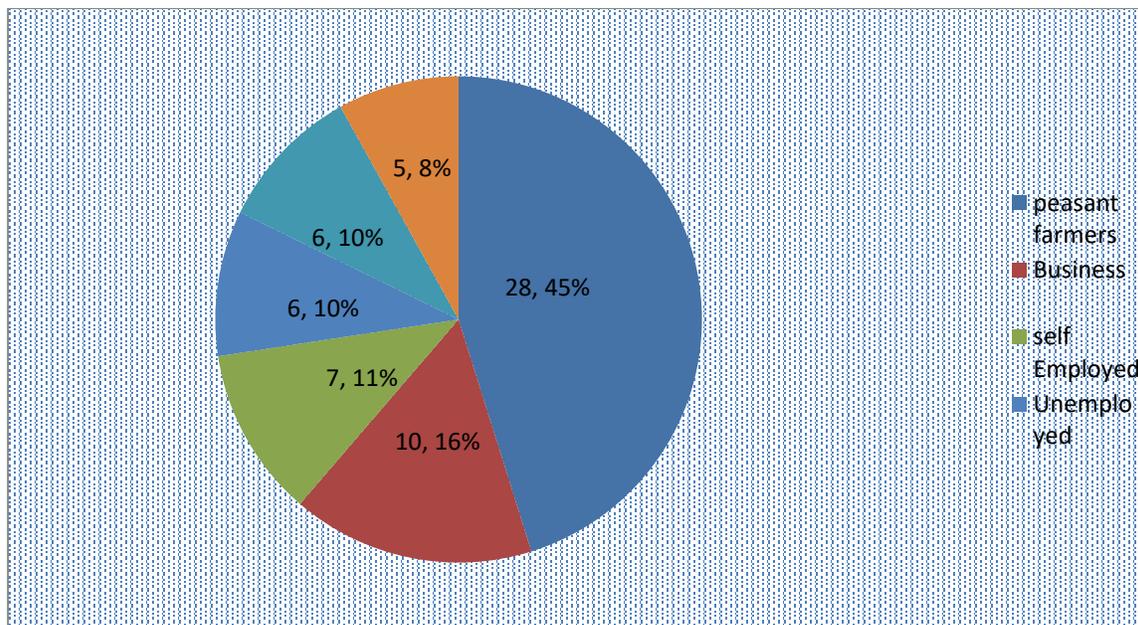

Figure 1: Occupation of Respondents. (n=62

Most of the respondents 28(45.2%) were peasants, followed by business 10(16.1%), self-employed 07 (11.3%), unemployed 06(9.7%), house wife 06(9.7%) and civil servants were only 05(8.1%) of the respondents

Table 4: Religion of The Respondents. (n=62)

RELIGEON	Frequency	Percentage%
Catholics	27	43.5
Protestants	23	37.2
Muslims	09	14.5
Others	03	04.8
Total	62	100

Most of the respondents were Catholics, 27 out of 60 (43.5%), followed by protestants 23 out of 60 (37.2%), the Muslims 09 out of 60 (14.5%), others were 03 out of 60 (04.8%).

Table 5: Respondents who have and have not tested for tuberculosis. (n=62)

PARTICIPANT TESTED FOR TB	FREQUENCY	PERCENTAGE (%)
Yes	12	19.4
No	50	80.6
TOTAL	62	100

Twelve out of sixty-two (19.4%) respondents had cough mucous tested for TB and 50 out of 60 (80.6%) didn't have their cough mucus tested for TB.

TB TEST RESULT OF THE RESPONDENTS (n=12)

Five respondents tested TB positive while 7 respondents tested negative. Out of the 5 positive test, 01 was diagnosed 12 months ago (old case) and 04 was diagnosed less than 6month ago. Therefor the prevalence of TB among HIV-sero positive attending HIV clinic at KIUTH is as computed bellow:

Prevalence = (Old cases+ New cases) x 100
          Total number of participants.

Prevalence= (1+4) x 100
            62
= 8.06 per 100 participants.

Table 6: TB Test Result of the Respondents (n=12)

TEST RESULT	WHEN	FREQUENCY
TB positive	> 12 months ago	01
	<6month ago	04
TB negative	Not applicable	07
TOTAL	Not applicable	12

RESPONDENT KNOWLEDGE, ATTITUDE AND PERCEPTION ON TB/HIV CO-INFECTION.

Majority of the respondents 26(42.0) said TB can be acquired through sitting near a TB patient, followed by sharing eating utensils, 19(30.6%) and Air borne 17(27.4%) 15 respondents (24.2%) said all TB patients have HIV, 22 (35.5%) said most of the HIV patients have HIV and 25 respondents (40.3%) are not sure.

The Highest number of respondents 36 out of 62(58.1%) said they are not sure whether TB can be cured in HIV patients, 07 out of 62 (11.3%) said TB not can be cured in HIV patients and 19 out of 62 (30.6%) of the respondents said TB can be cured among HIV patients.

Table 7: Showing patients knowledge, attitude and perception on TB/HIV co-infection

KNOWLEDGWE OF MODE OF TRANSMISSION OF TB	FREQUENCY	PERCENTAGE
Sitting near a TB patient	26	42.0
Shearing eating utensils	19	30.6
Air born	17	27.4
TOTAL	**62**	**100**
TB CAN BECURED	**FREQUENCY**	**PERCENTAGE**
Yes	30	48.4
NO	07	11.3
Not Sure	25	40.3
TOTAL	**62**	**100**
PERCEPTIONS ON TB PATIENTS HAVING HIV.	**FREQUENCY**	**PERCENTAGE**
All	15	**24.2%**
Most	22	**35.5%**
Not sure	25	**40.3%**
TOTAL	62	100

DISCUSSION

Out of the 62 patients who participated in the study, only 12 (19.4%) had tested for tuberculosis and 50 (80.6%) had not tested for tuberculosis. This shows lack of availability and accessibility of TB testing facilities and services.

During the study, 5 respondents reported that they tested positive for tuberculosis, one tested more than 12month ago and 4 tested within the last 6 month. According to these findings, the prevalence of TB is therefore 8.06 %. This is in line with a few studies conducted in resource limited settings in Uganda which showed that the prevalence of TB among people living with HIV ranged between 5.5%-7.9% [54-63].

Most of the respondents 26(42.0%) said TB can be acquired through sitting near a patient with TB, followed by shearing eating utensils, 19 (30.6%) and air borne 17(27.4%). The study found that generally, people are aware about the modes of transmission of TB but there is still need for more awareness.

From the data collected and analyzed, thirty respondents (48.4%) said TB can be completely cured, 07 (11.3%) respondents said TB cannot be cured and 25(40.3%) are not yet sure about the cure of B.Ths. means

many people are still not aware that TB can be cured and still need more sensitization. There is lack of information and knowledge about TB/HIV co-treatment, leaving many patients still to be not certain whether TB is curable in HIV patients. This was evidenced by the following findings; The highest number of respondents 36 out of 62 (58.1%) said they are not sure whether TB can be cured in HIV patients, 07 out of 62 (11.3%) said TB not can be cured in HIV patients and 19 out of 62 (30.6%) of the respondents said TB can be cured among HIV patients. This shows that most patients are still lack reliable sources of information on TB treatment.

The study found that most of the respondents 28(45.2%) knows that having TB means having HIV, 18 respondents (29.0%) said having TB does not mean having HIV and 16(25.8%) are not sure. As seen from the above study, most of the people are not yet aware whether HIV goes hand in hand with tuberculosis. The lack of awareness is still due to limited easy access to information about TB/HIV co-infection

CONCLUSION

The prevalence of TB in HIV sero-positive attending HIV clinic at KIUTH has increased. Generally, TB is affecting patients of all age groups. The illiterate and low-income earners are the most affected by tuberculosis. Patients still lack access to TB screening facilities and services. Most patients are still not aware if TB in HIV is curable. There are still co-treatment challenges in TB/HIV patients. TB/HIV patients still have challenges accessing their health services.

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