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Prevalence and Control of Tuberculosis in HIV/AIDS Patients Attending Kampala International University Teaching Hospital

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ABSTRACT

Tuberculosis (TB) is one of the world's most common causes of death in the era of human immunodeficiency virus (HIV). TB and HIV are called a deadly duo as HIV weakens the immune system and makes them more susceptible to TB infection. TB mortality remains high in Uganda, with about 4,000 people dying of the disease every year, an equivalent of the population in a parish setting. The study aimed to find out the prevalence of tuberculosis among HIV-infected patients reporting 10 Kampala International University Teaching Hospitals. This was a cross-sectional study conducted among HIV-infected patients within lshaka and the surrounding villages. The study randomly recruited 76 patients who filled in the questionnaires administered to determine the prevalence and methods of infection control among HIV /TB-infected patients. The prevalence of TB among HIV-infected patients was still high at 0.5% despite patients having known their status. Analysis of the socio-demographic factors showed that TB incidence was distributed throughout all ages provided one was HIV positive although onset was highest in early adulthood (26-30 years) and had a death rate of 9.1 %. Administrative, personal control measures and DOT centers were the modal of control in the management and control of tuberculosis at KlUTH. Personal protection and environmental control of infections were affected by administrative decisions and thus poorly implemented. Despite the reduction in the mortality) of tuberculosis among HIV-infected persons, there is a lot of room for improvement, especially in the control of infections.

Keywords: Tuberculosis, HIV/AIDS, Prevalence, Control measures, Kampala International University Teaching Hospital

INTRODUCTION

Tuberculosis (TB) is one of the diseases that has survived for centuries globally and is still very common to date with an estimated 8.9 million new cases worldwide in 2014 [1]. The increase in the number of people living with human immunodeficiency virus (HIV) has dramatically increased the occurrence of TB and it shares about twenty live or all cases of the deaths [2]. The association between HIV and tuberculosis presents an immediate and grave public health and socioeconomic threat in developing countries [3]. The World Health Organization (WHO) has prioritized tuberculosis as a leading killer disease among people living with HIV (WHO, 20I0a). TB is caused by the bacterium *Mycobacterium tuberculosis*, which can be present as either latent TB infection or TB disease [5]. Latent TB infection means that TB bacteria are living in the body but not causing any symptoms, and people with latent TB are not sick, have no symptoms, and cannot spread TB bacteria [6]. Persons infected by the bacteria have about a 10% chance of developing tuberculosis during the remainder of their lives: Thus, they have a less than 0.5% chance of developing overt disease annually [7] while 10% of persons infected by both TB and HIV develop tuberculosis disease annually. HIV infection implies that it activates dormant tuberculosis to rapid disease progression of tuberculosis and death [8]. The World Health Organization (WHO) has prioritized TB as a leading killer disease and the most common opportunistic infection in patients living with HIV [4]. In resource-limited countries, at least one 111 four people living with living with HIV suffer death due to TB [9]. Collaborative TB/HIV activities are essential to decrease the mortality of TB among HIV patients and to ensure that HIV-positive TB patients are identified and treated appropriately [4]. Fortunately, there are several treatment options for people living with HIV who also have either latent TB infection or TB disease. In recent years implementation of collaborative TB/HIV activities has been rising globally [5] and people living with both HIV and TB should consult with a healthcare provider or their state or local health department for treatment options. Tuberculosis control in Africa has yet to adapt to the new climate or antiretroviral availability because

many barriers exist, from drug interactions to historic differences in the way that tuberculosis and HIV are perceived [10]. In 2003, an estimated 8·8 million new cases of tuberculosis resulted in l.7 million deaths with 27%, of these cases and 31% of these deaths in Africa [11]. In countries with the highest HIV prevalence, more than 75% of cases of tuberculosis are HIV-associated and tuberculosis is often the first manifestation of HIV infection, and doubles as the leading cause of death among HIV-infected patients [12]. Uganda had an estimated 60,000 patients living with tuberculosis in the country with about 44,000 TB patients detected last year while 16,000 patients remain undetected due to lack of awareness, poor health-seeking behavior, inadequate diagnosis such as non-functional x-ray machines, limited capacity of health workers and lack of a patient-tracking mechanism [13]. Uganda is also ranked 20th among 22 countries with a high burden of TB. 54% of TB patients are HIV co-infected and about 30% of the HIV-related deaths are attributed to TB [14]. Cases of tuberculosis (TB) have continued to arise with the risk estimated to be between 16 and 31 times greater in people living with HIV than among those without HIV infection [15]. In 2014, there were 9.6 million new cases of TB of which 1.2 million were among people living with HIV. WHO recommends 12 TB/HIV collaborative activities, including the Three I's for TB/HIV [16]. This study examines research topics that could contribute to improving TB prevention among people living with HIV, including preventive TB therapy, TB infection control, antiretroviral therapy, and TB vaccines.

MATERIALS AND METHODS

Study Area

KIU-TH is located in lshaka municipality in Bushenyi district approximately 310 kilometers along the Mbarara-Kasese highway in western Uganda. The study was conducted at the CHAI clinic of the facility.

Study Design

A cross-sectional study was used to conduct the study due to the research having been carried out at a specific time without following up with the study participants or looking into their history.

Study Population

The study targeted all the HIV patients who reported to the CHAI clinic and had ever been diagnosed with TB disease.

Sample Size Determination

The sample size for the patients attending the Health Unit was calculated using the Fishers formula (1962), given by:

$$n = \frac{z^2 Pq}{d^2}$$

Where n= sample size z= confidence interval, p= total Population of the target population
Assume p=50% (maximum variability). Furthermore, suppose we desire a 95% confidence level and ±5% precision
When: p = 0.5, q = 1-p (0.5), and d = 0.62, z = l.96(constant at 96% Confidence Interval)

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.11^2}$$

$$n = 76$$

Therefore: n= 76 respondents were considered in this study

Sampling Techniques

The study employed convenience sampling techniques to select respondents. Both patients admitted at the facility and those who come to the health unit for follow-up during ARV and TB drug refills, and medical check-ups were selected to participate on arrival. These sampling techniques enabled efficient data collection within a short time, thus saving time and money. Provide the flexibility needed to collect data within a short time and take advantage of those who happened to be there at the time.

Inclusions

All HIV-infected patients reporting to KIU-TH aged 15 to 49 years. This is because the most infected population falls within this age bracket. Patients who were mentally sound and were willing to participate. Patients present at the time of data collection.

Exclusions

Patients with mental illnesses or altered levels of consciousness. Patients admitted to the Intensive Care Unit. Critically ill patients.

Data Collection Method

Document analysis (case files) was used to determine the duration, type, and nature of treatment that the patients had received for HIV or TB. This was determined to be key and was supplemented by self-filled questionnaires. This was because of the short time available as well as the objective of the study.

Study Limitations

Patients who were less than 15 years and over 49 years of age, patients who were health workers or staff at the

hospital, and mentally sick patients; unconscious patients were likely admitted to the ICU section.

Data Quality Control

To ensure the quality and validity of this work. It was done under the close supervision of 111, supervisors.

Ethical Consideration

The researcher obtained permission from the administration of KIU-TH and the faculty of Allied Health Sciences before data collection was commenced. The questionnaires were answered voluntarily and the names of participants were not required. Confidentiality of patients was also maintained by the researcher.

RESULTS

Table 1: Distribution of Socio-economic factors

Age in years	**Frequency**	**Percentage (%)**
15-20	5	6.6
21-25	8	10.5
26- 30	25	32.9
31 – 35	10	13.2
36 – 40	9	11.8
41 – 45	7	9.2
46- 49	12	15.8
Sex distribution of respondents		
Male	35	46.1
Female	41	53.9
Tribe of Respondents		
Munyankore	32	42.1
Mukiga	24	31.6
Muganda	9	11.8
Others	11	14.5
Marital status		
Married	53	69.7
Unmarried	23	
Total	**76respondentswereused**	**100%**

Table 2. Symptoms of TB disease among HIV-infected patients seeking treatment at KIUTH.

Signs and symptoms	Number of respondents
Cough for> 2 weeks	9
Evening fevers	12
Night sweats	8
Weight loss	15
Tiredness	68
None	2

Table 3. Tuberculosis test results.

Respondents	**No. of respondents**	**Percentage**
Confirmed cases	8	10.5%
Unconfirmed cases	68	89.5%

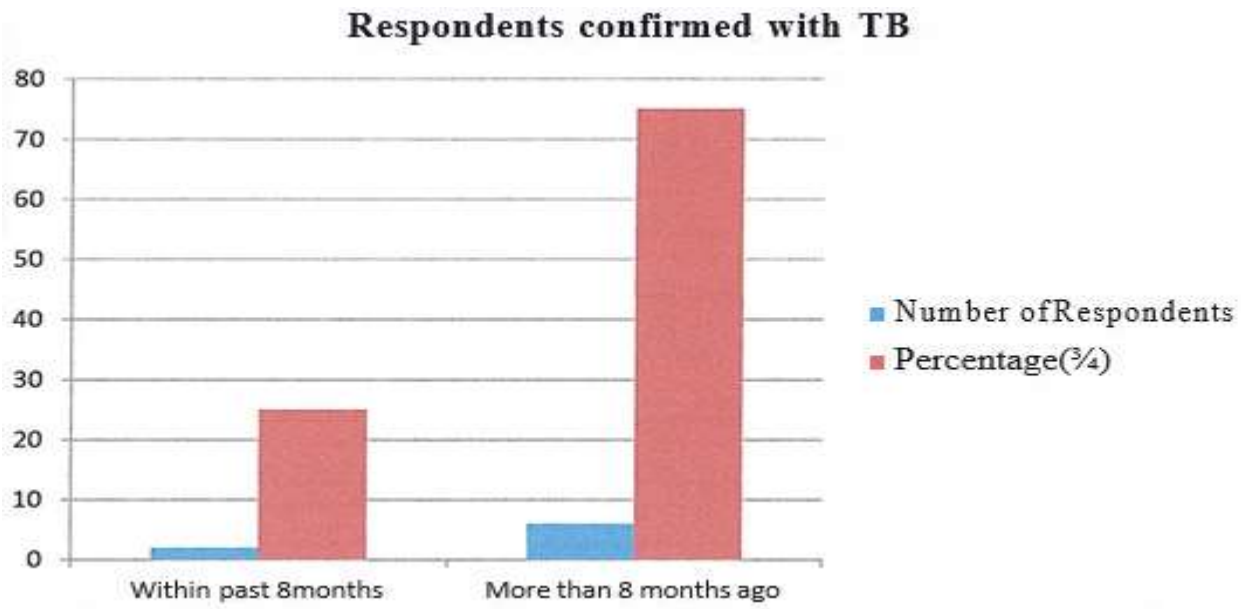

Figure 1: Those confirmed with tuberculosis disease

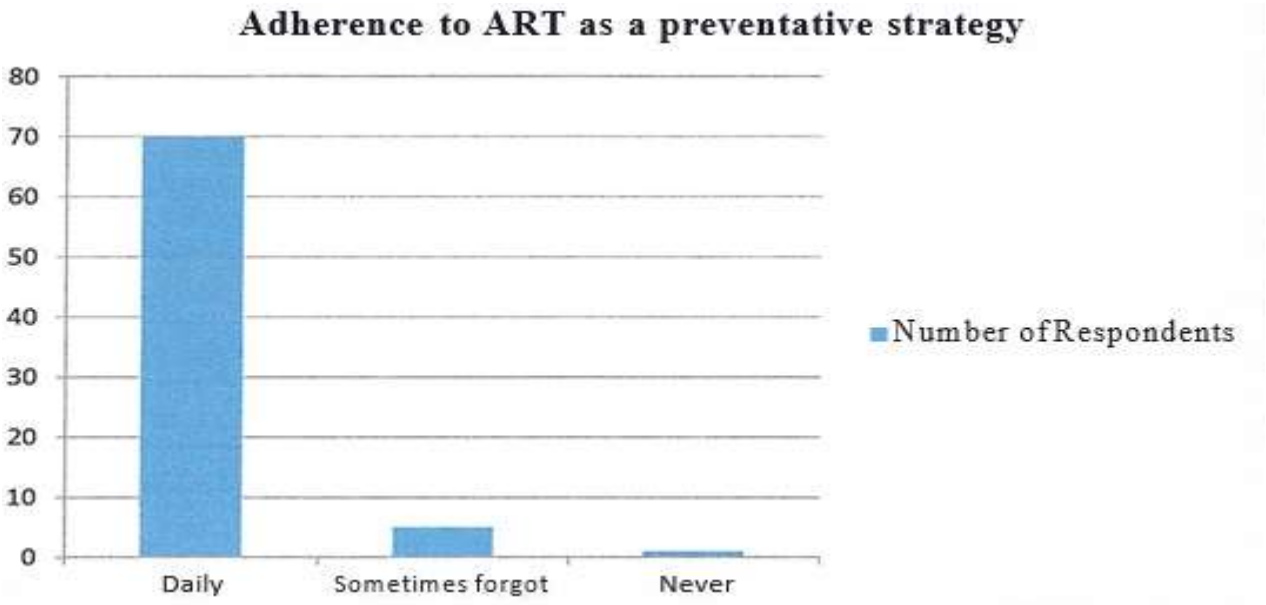

Fig 2: Adherence to ART as a preventative strategy

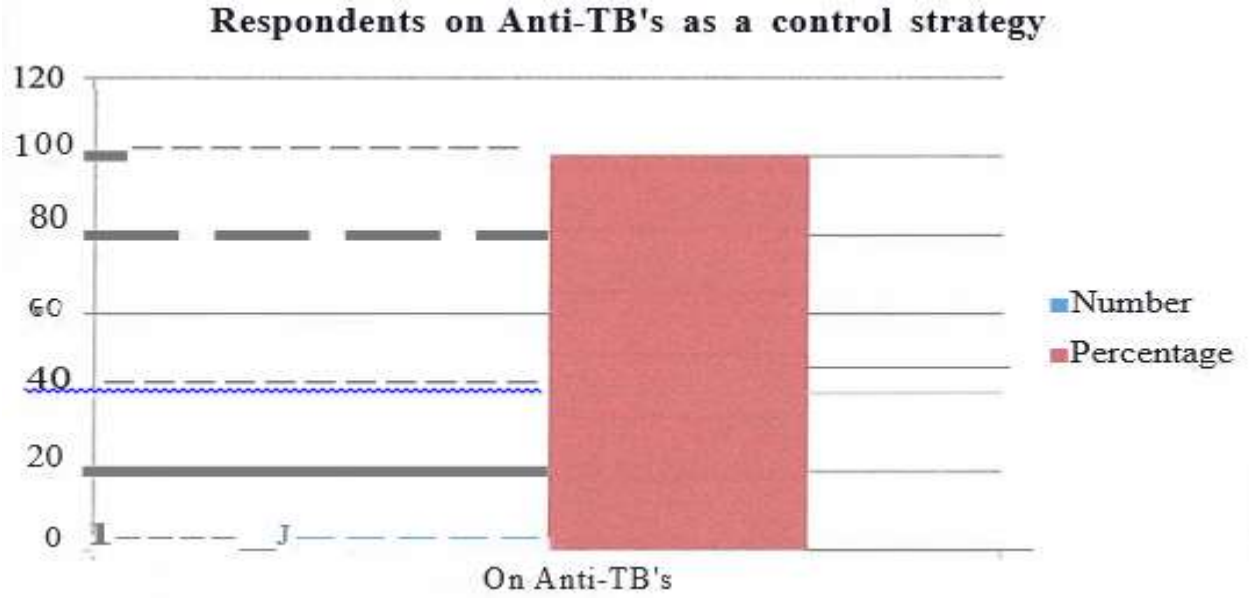

Fig 3: Anti-tuberculosis treatment as a control strategy

All 3 respondents (100%) who had been diagnosed with tuberculosis within the last eight months were still on anti-tuberculosis medication.

Table 4: Commonly practiced infection control methods both at personal and health facility level

Infection Control practice	**Responses**	
	Number	**Percentage**
Ventilated Space	35	46.1%
Separate House	38	50.0%
Separate utensils	3	3.9%
Total	**76**	**100.0%**

DISCUSSION

HIV/AIDS is a remarkable underlying immune-suppressive disease. It increases the risk of infection/activation of latent TB because of immune suppression with HIV prevalence in incident TB despite greater than 80% having known their HIV status [17]. This is true because this research was conducted only among confirmed HIV-infected people who still reported the occurrence of tuberculosis disease. The incidence of TB disease among HIV-positive persons has reduced although the disease still poses a threat to the health of all HIV-positive people. The WHO TB Global Report (2013) put the incidence of tuberculosis in HIV at 14.7% in 2013 which has since reduced based on the results from this research which placed the prevalence of TB disease among HIV-infected persons at 10.5%. This is because of the improved diagnostic techniques, availability of reagents plus equipment and prompt management of tuberculosis today [18]. This study showed that all of the patients at KIUTH practiced at least one form of control strategy. The findings showed that infection control was a recognized practice among HIV patients infected with tuberculosis according to the three-level hierarchy of control measures [5]. However, the findings also noted that tuberculosis infection control among HIV patients was lacking especially when it came to administration control and comprehensive personal protection to date [19], very few studies in Uganda have described the effectiveness of implementing a combination of infection control among rural health facilities in Uganda [20, 21, 22]. In this study, the majority of the patients (50%) reported the use of separate houses for TB-infected individuals as the most practiced infection control strategy and 46.1% used ventilated space in addition to other control measures such as cough etiquette but only 3.9% used separate utensils and therefore increasing chances of spread especially from sharing drinking cups or glasses [23]. This study noted that available transmission control strategies and technologies, such as early diagnosis, triage, and separation masks on patients and treatment, need to be implemented [24, 25].

CONCLUSION

This study showed that administrative, personal control measures and DOT centers were the models in management and control of tuberculosis at KIUTH. Personal protection and environmental control of infections were affected by administrative decisions and thus poorly implemented. Despite the reduction in the mortality of tuberculosis among HIV-infected persons, there is a lot of room for improvement, especially in the control of infections.

Recommendations

To plan for and implement the administrative control of TB Infection Control (TIC) among HIV-infected clients by creating an isolation unit for infectious patients to reduce the number of TB infections as a result of direct contact with TB-infected patients.

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