THE PREVALENCE OF PULMONARY TUBERCULOSIS IN HIV SERO-POSITIVE PATIENTS ATTENDING ART CLINIC AT PALLISA GENERAL HOSPITAL IN PALLISA DISTRICT.

BY

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DECLARATION

I **MUKAIRE HUMARI, (DCM/0062/143/DU)** hereby declare that this dissertation is my original work and has never been submitted to this or any other university for any academic award.

SIGNATURE…….....

DATE……...

DEDICATION

I dedicate the results of this study to my wife Kantono Harriet, my friends Kipala Joshua, Ssengendo Peter and my supervisor Mr: Tashobya Daniel who endeavored to take me throughand for their continuous support and encouragement during my undergraduate training.

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I thank the almighty Allah for keeping me strong and healthy and for seeing me through this physically and mentally rigorous but emotionally rewarding course.

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TABLE OF CONTENTS

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS:

AIDS:	Acquired Immune Deficiency Syndrome
ART	Antiretroviral therapy
HAART	Highly Active Anti- retro Therapy
HCV	Hepatitis C Virus
HIV	Human Immune Deficiency Virus
MOH	Ministry Of Health
OI	Opportunistic Infection
RCT	Routine Counseling and Testing
TASO	The AIDS Support Organization.
VCT	Voluntary Counseling and Testing
WHO	World Health Organization

ABSTRACT

Background

TB and HIV remain the major health problem in Uganda. HIV is the leading risk after for the development of TB and TB is the leading cause of death in people with HIV/AIDS with the prevalence of 7.3% and approximated 50-60% of TB patients co-infected with HIV.

Purpose of study

The purpose of this study was to compile a report on the prevalence of pulmonary TB in HIV sero-positive patients attending ART clinic at Pallisa General Hospital.

Methods

A cross sectional study was used for all males and female of any age attending Pallisa General Hospital

Results

Among the 200 HIV sero-positive patients interviewed, 14% were co-infected with TB and among them, 64% were males and 36% were females. Patients having a low CD4 below 250 were highly predisposed to TB with 23% followed by smoking with 16%. Patients with drenching night sweats had the highest percentage of smear positive with 43% followed by cough with 28%.

Conclusion

Since the increase in HIV infection rate leads to increase in TB disease, there is need to re-examine the strategies for their control, the development of programs with an integrated approach to inducing behavioral change and promoting condom use may reduce the infectivity of HIV transmitters and the susceptibility of HIV exposed persons.

Recommendation

All patients attending HIV clinic should be assessed and tested for TB .HIV and TB mass awareness campaigns among people .This should be done at community level as part of primary health care.

CHAPTER ONE

1.0 Introduction

This chapter introduces the back ground of the study, problem statements, study objectives, research questions and justification of the study.

1.1 Background of the study

Tuberculosis (TB) and HIV have been closely linked since the emergence of AIDS. Worldwide, TB is the most common opportunistic infection affecting HIV-seropositive individuals by producing a progressive decline in cell-mediated immunity, HIV alters the pathogenesis of TB, greatly increasing the risk of disease from TB in HIV co-infected individuals and leading to more frequent extra pulmonary involvement, atypical radiographic manifestations, and paucibacillary disease, which can impede timely diagnosis.

In 2006 it was estimated that there was 9.2million incidence cases and among those 0.7 million cases were HIV positive. The HIV prevalence in TB patients is less than 1% in the western pacific but 22% in Africa, however in countries with the highest HIV prevalence, more than 75% of cases of TB are HIV associated. Southern Africa has the highest prevalence of HIV infection and had the highest incidence of TB before the HIV era (Badri et al, WHO, 2008)

Human Immune deficiency Virus (HIV) is a retro virus identified as the etiologic agent for acquired immune deficiency syndrome (AIDS), while tuberculosis (TB) is an air borne infection caused by the tubercle bacillus mycobacterium tuberculosis (MTB). TB is a global health priority being a killer disease that manifest in its pulmonary form in up to 70% of cases or as extra pulmonary affecting all parts of the body(Cacho J, 2007)

The risk of developing tuberculosis is estimated to be between 26 and 31 times greater in people living with HIV than among those without HIV infection. In 2014 there were 9.6million cases of TB of which 1.2 million were among people living with HIV globally (WHO,2014)

Africa is facing the worst tuberculosis epidemic since the advent of the antibiotics era. Driven by a generalized human immune deficiency virus (HIV) epidemic and compounded by weak health care systems, inadequate diagnostic laboratories and conditions that promote transmission of infectious agents, the devastating situation hasbecome exacerbated by the emergence of drug-resistant strains of mycobacterium tuberculosis(Ahmed,2013).

In Uganda TB and HIV remain the major public problems.HIV is the leading risk factor for development of TB and TB is leading cause of death in people with HIV/AIDS. The HIV prevalence in Uganda is estimated at 7.3%, and approximately 50-60% of TB patients are also co-infected with HIV (MOH, 2016).

1.2Problem statement.

A 2011 estimate indicates that 23.5 million people living with HIV resided in Sub Sahara Africa, which represents 69% of the global HIV burden. Also in 2011, 8.7 million people became ill with tuberculosis of which 1.4million died. There were about 1.1 million new cases of HIV-positive new TB cases with 79% of them living in Africa and globally about 430,000 people died in the same year of HIV associated TB(Harris A 2011). It is also estimated that almost 33% of all people living with HIV are co-infected with both TB and HIV, (between 12 and 15 million people) (Aderaye G, 2007).

In parts of Sub Sahara Africa, up to 70% of TB Patients are co-infected with HIV. It is estimated that up to 33% of all AIDS deaths Worldwide can be directly attributed to TB. In Sub-Sahara Africa this increases to 50%. Tuberculosis and HIV together are responsible for the deaths of over 4 million people annually(WHO,2014).When HIV was emerging in the early 1990s in Nigeria, 2% of TB Patients were HIV infected but the co-infection rate rose to 21%-29% (Schoeman JH et al, 2008).

A quantifiable measure of the intensity of the burden of tuberculosis infection among HIV/AIDS patients in Pallisa general hospital, Pallisa district and also information regarding associated factors is lacking. However, according to proposals from the hospital the number of referrals due to tuberculosis is increasing and it has been recognized to be among the leading causes for referral for further management.

Despite the fact that different studies have been conducted on HIV-TB co-infection in Uganda information about the magnitude and spectrum of pulmonary tuberculosis and their CD4 correlates is still scarce in the area.

Therefore, this study added updated information on occurrence of pulmonary tuberculosis and their immunological correlates among HIV-infected patients attending ART clinic.

1.3 Study Objectives;

1.3.1 Broad objectives.

- To establish the prevalence of pulmonary tuberculosis infections among HIV/AIDS patients attending Pallisa General Hospital, Pallisa district.

1.3.2 Specific objectives.

- To find out the proportion of patients with pulmonary tuberculosis among HIV sero-positive patients attending HIV clinic in Pallisa General Hospital.
- To determine the factors that expose HIV sero-positive patients to pulmonary tuberculosis in Pallisa general hospital.
- To identify the most common clinical presentations of pulmonary tuberculosis among HIV sero-positive patients attending Pallisa General Hospital.

1.4 Research questions.

- What is the proportion of patients with pulmonary tuberculosis among HIV sero-positive patients attending HIV clinic in Pallisa general Hospital?
- What are the risk factors that expose HIV sero-positive patients to pulmonary tuberculosis?
- What are the most common clinical presentations of pulmonary tuberculosis among HIV sero-positive patients attending Pallisa General Hospital?

1.5 Study justification.

Tuberculosis continues to be a problem among HIV/AIDS patients attending Pallisa General Hospital yet little literature about this health problem is available. Therefore this research was to help put forward information about the problem and help health workers know, and probably help to improve health service delivery and reduce morbidity and mortality of HIV/AIDS patients. The data collected and additional information from the research was to help Pallisa general hospital, Pallisa local government and health agencies in policy review strategies for HIV/AIDS patients and also support the aids support programs so as to achieve good health for all.

CHAPTER TWO

LITERATURE REVIEW

2.0Introduction

Tuberculosis (TB) is a chronic infectious disease that has represented a major health problem over the centuries and it has accounted for more human misery, suffering and loss of earning and failure of economic and social development than any other disease.(Dooley SW 2012).

According to the WHOestimations, about one third of the world's population is infected with tuberculosis bacteria, about ten million cases of active disease are estimated to occur each year, and annually three million people die oftuberculosis. The human immune deficiency virus (HIV) has substantially altered the epidemiology of TB by increasing the risk of reactivating latent TB, increasing chance of TB infection once exposed to tuberclebacilli (re-infection) and by increasing the risk of rapid progression soon after infection,(Bell J 2011).

Several studies documented that the person infected with Mycobacterium tuberculosis (MTB) only has a 10% risk of developing TB during life time but for persons co-infected with both TB and HIV the annual risk of developing active TB disease exceeds 10%. HIV does not only increase the prevalence but also complicates thefollow up and compromises the response to anti-TB treatment,(Rose C, 2011).The complication of treatment outcomes of both diseases due to the TB-HIV co-infection results particularly from the concomitant use of anti-retroviral treatment (ART) and intensive phase of TB treatment; additionally, it leads to drug-drug interaction, side effects of multiple drugs, increased pill burden, decreased adherence anddevelopment of higher rate of drug resistant organisms due to the combination of the above factors. HIV also causes difficulties in diagnosis and treatment of TB due to unusual clinical picture with increased smear negative Acid Fast Bacilli (AFB) pulmonary TB, atypical finding on chest radiography and increased prevalence of extra pulmonary TB.(Sheerah P, 2010).

2.1 Prevalence of tuberculosis among HIV patients.

One third of the world's population has latent Tuberculosis (TB) infection, which increases the risk of becoming ill with TB. This infectious disease is a leading killer among people living with human immunodeficiency virus (HIV), and at least one in four deaths among people living with HIV can be attributed to TB. Many of these deaths occur in resourcelimited settings, [Blumberg HM, 2005].People living with HIV also have an estimated 20 - 30 times greater risk of developing active TB than people without HIV infection.The estimated total number of incident cases of tuberculosis worldwide rose to 9.4 million in 2009, more than at any other time in history. The worldwide tuberculosis incidence rates are estimated to have peaked in 2004 and since then decreased at a rate of less than 1% per year [Datiko D, 2008]. Tuberculosis is still a disease of poverty that is associated with overcrowding and under nutrition.

In 2009, there were an estimated 2.6 million people who became newly infected with HIV. That is more than one fifth fewer than in 1997 when there was an estimated 3.2 million newly infected people. 1997 was the year when the HIV epidemic peaked(Jones B et al 2003)

There was an estimated 14% HIV positive TB patients globally in 2008. Around 80% of them live in sub-Saharan Africa(Fyrne et al, 2008). WHO has identified goals for TB/HIV (Isoniazid preventive therapy, intensified case finding for TB, and Infection control).Achieving these goals will reduce the burden of TB among people living with HIV and therefore must be urgently implemented by all HIV services. People living with HIV need early diagnosis and treatment of active TB disease. If TB is not present, they should receive Isoniazid Preventive Treatment (IPT). The treatment is not expensive, but can lead to massive reductions in number of deaths(WHO, 2009)

2.2 Risk factors that expose HIV patients to tuberculosis.

Several studies have cited various risk factors implicated in TB and spread of the disease in order to assist in proper utilization of public healthcare resources and prioritize targets for TB control. In this connection, the most significant independent risk factor in association with active pulmonary or extra-pulmonary TB is HIV infection contributing to ongoing transmission among individuals (Corbett et al.,2013; Singh M 2005).Age has also been shown as a risk factor in increasing TB incidence; while women have been found to be more

susceptible to TB with 11.6% than men with 7.7% probably due to the effect of female hormones or underreporting of TB cases (Okodua et.al,2014).

TB is also associated with reduced CD4 count below 250 cells to a certain level of 23%. This is due to the depressed immunity that makes them susceptible to fresh TB (Kilenga et al, 2014).

Other risk factors include; past history of TB in the family, smoking, place of residence,placeof origin, malnutrition and alcoholism (Wandera et al,2013). In countries with low TBincidence, immigrants from countries with high TB prevalence constitute potential increased risk for recent transmission of infection to local populations (De cock KM, 2006). In some industrialized countries, TB revival has been linked to certain risk factors, such as overcrowding, reduced funding, poverty, homelessness, improper TB management and negligence in implementing TB control programe, (Liberato JR 2004). In different parts of the world, consumption of unpasteurized milk was observed in association with TB caused by M. Bovis.Silicosis, an occupational disease occurring among mine workers exposed to silica dust,predisposes TB and non-tuberculosis mycobacterium (NTM) infections (Malika, 2005). Other researchers reported the occurrence of TB transmission in hospitals in association with healthcare workers born in countries with high TB burden but without further continued spread (Van R et al., 2005). An association between tuberculosis (TB) and body wasting has been long recognized. Malnutrition impairs host immunity and predisposes to TB while TB itself can cause malnutrition (Zacharia et al., 2006)

Malnutrition or poor diet and food low in calories, puts a person at greater risk of TB and it may impair survival in TB patients. It is thought that chronic lack of appetitecan be one of the causes of malnutrition associated with TB and therefore may be a potentialindependent risk factor for latent TB. Latent TB infected people with poor appetite develop active TB rapidly, and then these patients have poor treatment outcome. Studies have shown that supplementation with vitaminsand Zinc (mineral) during treatment of pulmonary TB may reduce mortality in those co-infected with HIV (Kusar M et al., 2007).

Furthermore, malnutrition and intestinal parasites cause immunosuppression, which in turn may cause false-negative tuberculin skin tests (TST) and failure to identify TB infection (Zacharia et al., 2006)

The association between smoking and TB has been investigated for several decades. Both passive and active exposure to tobacco smoke has shown to be associated with TB infection and with the transition from being infected to developing active TB disease (Borgdorff et al, 2008). There may be several reasons for the association between smoking and TB. Smoking may decrease immune response or damage the protective effect of tiny hair –like structures called cilia in the airways, resulting in increased TB risk. It has been shown that heavy smokers are more likely to have cough, dyspnea, chest radiograph appearances of upper zone involvement, cavity and milliary appearance, and positive sputum culture, but are less likely to have isolated extra-pulmonary involvement than non-smokers.

Smoking has been found to be associated with both relapse of TB and TB mortality indicating 16% (Kilenga et al,2014). There appears to be enough evidence to conclude that smoking is causal associated with TB disease. Patients with TB need and should receive counseling and assistance in stopping smoking.

A meta-analysis study reported smokers were 73 percent more likely to become infected with TB and more than twice are likely to develop active TB. Overall, smokers are 40 -60 % more likely to develop active TB after being infected with TB bacteria (Lawson et al., 2005; Davies et al., 2003)

2.3 Clinical presentation of tuberculosis with HIV-infection.

Tuberculosis is a disease with protean manifestations. The clinical presentation of tuberculosis can mimic several diseases and can be a diagnostic problem even in endemic areas. Virulence and dose of the infecting mycobacterium, the immune status of the host, the organ system(s) involved, all influence the clinical manifestations of tuberculosis. Patients with tuberculosis often develop the symptoms insidiously and present with constitutional symptoms of tuberculosis toxemia and with symptomsand signs related to the organ/system(s) involved (Koech et al., 2007).

Human immunodeficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS) have a profound impact on the clinical presentation of tuberculosis.

Clinical presentation of tuberculosis in patients with HIV infection depends on the severity of immunosuppression (Thatcher T, 2008). In patients with early stages of HIV

disease, the clinical presentation of tuberculosis tends to be similar to that observed in persons without HIV infection. Pulmonary disease is most common often with focal infiltrates and cavities. When the immunosuppression is more marked (CD4 count <200ml3), the features of tuberculosis are atypical with a much greater frequency of extra-pulmonary involvement, especially of the lymph nodes (Perez M , 2007).

Diffuse pulmonary disease without cavitation often involving the lower lobes and prominent paratracheal and mediastinaladenopathy is common. In patients with advanced disease, disseminated and miliary disease is more often seen (Fitzgerald D 2010). Usually patients with tuberculosis present with fever, which often develops in the late afternoon or evening. The fever is usually low grades at the onset and may become high grade with progression of disease. Some patients may remain afebrile. Patients also manifestwith weight loss, which may sometimes precede the other symptoms (Kutwaet al., 2004).

The weight loss can be profound reducing the patient to a skin and bones like appearance. Tiredness, fatigue, night sweats, and anorexia are other important constitutional symptoms observed in patients with tuberculosis (Bacha et al., 2004).

Extra pulmonary TB occurs more frequently among HIV seropositive individuals than among sero-negative (De Cock et al., 2006). The symptoms of active TB are often non-specific and mainly pulmonary; the patient may present with fever, chronic persistent cough with or without blood, lack of appetite, night sweats, weight loss and severe thoracic pain. Failure of the immune system to combat the tubercle bacilli causes haematogenous spread of organisms to various sites to produce extra-pulmonary disease, (LiberatoJRet al., 2004). The extra-pulmonary form has many manifestations and accounts for only 20% of all cases,(Malika and Godfrey P 2005). Haematogenous dissemination to the brain or meninges results in tuberculosis meningitis (TBM). The TBM is a debilitating disease characterized by symptoms of fever, headache, and lowered level of consciousness and stiffening of the neck (Matee et al., 2001).

In childhood, it is mainly a manifestation of severe extra-pulmonary TB .There is evidence to suggest that there is a close relationship between TBM strains isolated in the UK, (Dye et al., 2009).The defined course of infection with M. tuberculosis is dependent upon the inter-play of a

number of factors such as the host, environment and the organism. In addition, the clinical presentation of the disease has been shown to vary between ethnic groups, in relation to the infecting strain (Malika and Godfrey-Faussett, 2005). For instance, in England and Wales, one study showed that the majority of people originating from the Indian subcontinent were prone to extra-pulmonary TB, dominated by mycobacterial lymphadenopathy (Kusar et al., 2007; Millen et al., 2008). Genito-urinary TB was found to be more frequent in white populations, while pericardial TB was a more common phenomenon in Sub-Saharan Africans (Giradi 2004). This could be attributed to genetic susceptibility and host-pathogen interaction. In the presence of co-infection with HIV the clinical picture is altered with extra-pulmonary signs predominating (Debrie et al., 2001). Clinical presentations of TB and virulence may further vary with respect to strain genetic changes. Infection with the Beijing strain causes a febrile response during early treatment with anti-tuberculosis drugs (Koch et al., 2007). Increased virulence of these strains and their ability to fight against hostile microenvironment of the host immune system is thought to be related to genetic alterations in mutator genes and other factors (Rad et al., 2003; Rimer 2012). Treatment failures and relapses and ability to spread more quickly to persons in contact leading to outbreaks have also been reported in association with the Beijing strain.

The features of pulmonary tuberculosis (PTB) and the clinical presentation are influenced by the degree of immune-suppression. Patients with a well preserved CD4+T counts are likely to present with symptoms and signs similar to HIV- negative patients (cough for at least three weeks, night sweats and weight loss). Patients with more advanced immune-suppression often present with more atypical symptoms and signs. Symptoms may be nonspecific or absent and it may be difficult to distinguish from HIV disease or other opportunistic infections (Elston and Thaker, 2008).

Hemoptysis is usually considered to be hall mark of PTB in developing countries but not as frequently reported by patients with advanced HIV infection (Majid and Abba 2008). Because of this reason, the clinicians needs to have a high index of suspicion for PTB in symptomatic HIV-positive patients (Elston and Thaker, 2008).

Non-specific generalized skin rash on examination is normally associated with low CD4+T cell count(Moore et al., 2008)studied the patterns of skin manifestation and their

relationships with CD4+T cell counts among 384 HIV/AIDS patients in Cameroon and the findings showed that up to 68.8% patients presented with at least one type of skin problem. Generalized prurigo, oral candidiasis, herpes zoster and vaginal candidiasis were the most common skin problems associated with CD4+T cells count ≤ 200 ($P<0.05$). Generalized skin rash was associated with lower mean CD4+T cell counts less than 100 cells.

A study byWalter et al.(2013) among TB-HIV co-infected showed that skin infections and enlarged lymph nodes had the strongest prognostic effect in all the models considered.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter described the study area focusing on geographical location, population structure and many other aspects including Study design, sample size determination, sampling method, selection criteria, data Collection, data analysis, data presentation, data quality control, study limitation and Ethical consideration.

3.1 Study scope

The study was conducted at Pallisa general hospital located in Pallisa district. The district is located in Eastern Uganda and is bordered by Serere,Ngora and Kumi district to the north, Kaliro district to the west, Namutumba to the southwest and Mbale district to the East.

Pallisa is located at 01 01N, 33 43E coordinates and is 65km West of Mbale the largest town in the East sub region. The main socio-economic activity in the area is farming.The area also consists of majorly two tribes. itesots and bagwere. During the 1991 national population census, the district population was put at 166100 people, the 2002 national census estimated its population at 255,900 while in 2012 the population of Pallisa was estimated at 362,600 (UBOS, 2012

3.2 **Study population**

This study focused on all HIV sero-positive people who attended ART clinic in Pallisa general hospital

3.3 Study design

Across sectional study was used for males and females of any age attending Pallisageneral hospital in the ART clinic and for every patient who participated in the study was be sent to the lab for sputum and together with clinical presentation would draw diagnosis.

Also patients who have been already diagnosed of tuberculosis and are HIV positive were considered in the study.

3.4 Sample size

The study was done using Fisher's formula as shown below;

N = $(\frac{z^2pq}{d^2})$

Where:

n=Desired Sample size

Z=Standard deviation at the required degree of accuracy

P=Proportion of patients getting opportunistic infections

q=1-P

d=is the proportion of error the researcher is able to accept.

n =$\frac{1.96^2*0.9*0.1}{0.05^2}$

n=200 people

Therefore my sample size was200 people

3.5 The sampling method

A randomized method was used to HIV clients who came within the time of the study were considered for an interview and caretakers or any elder participating in the study was considered to provide relevant information on behalf of the children.

3.6.0 Selection criteria

The patients who met the inclusion /exclusion criteria in the duration of the study were taken as representative of the overall population.

3.6.1 Inclusion criteria.

The study included HIV positive patients who accepted to give consent, HIV positive patients attending Pallisa hospital ART clinic.

3.6.2 Exclusion criteria

HIV positive patients who failed to give consent, HIV positive patients who were deaf, those who were not attending Pallisa General Hospital ART clinic, HIV positive patients who were seriously ill or unconscious and those who were mentally disturbed were excluded.

3.7 Data collection method

The data was collected using both open and close ended structured questionnaire about socio-demographic, clinical and laboratory parameters. For the clinical and laboratory information, available baseline data at the time of commencement of ART was first captured including

prevalence of tuberculosis in HIV patients, Clinical presentation of tuberculosis and risk factors that expose HIV patients to pulmonary tuberculosis .The data was collected by the principle investigator himself and three research assistants.

3.8 Data Analysis Method

The data collected from the study was computed using Microsoft exceland the researcher usedmanual analysis by using a calculator to compute the percentages. The analysis was made in line with the study objectives so as to achieve the purpose of the study.

3.9 Data presentation method

The data collected was presented inform of tables, pie-charts, bar-graph, and narratives depending on the data analyzed.

3.10 Study Limitations

- Some patients were not willing to participate in the study and these were minimized by thoroughly explaining the purpose of the study and were assured of confidentiality for all the information, views and comments that were obtained from them and this took more time.
- Financial constraints.

3.11 Quality control

To ensure quality control, the researcher prior to the exercise conducted one day training for three research assistance who there-after were set for field testing of the study tools. Questionnaires were distributed for the pre-testing. The research assistants were supervised closely by the principle researcher himself.

3.12 Ethical Consideration

The study was carried out after the approval of the proposalby the supervisor.

An Introductory letter from the Administrator school of Allied health sciences was obtained.

The researcher also obtained permission from the Medical superintendent ofPallisa General Hospital.

Respondents were requested for their consent prior to the interviews.
Confidentiality was maintained all through the research process and the interviews were conducted in reasonable privacy

CHAPTER FOUR

4.0.0 RESULTS

4.1.0: Socio demographic characteristics

A total of 200 HIV patients were recruited during the study period and their socio demographic characteristics were as shown in the table.

Patients aged between 31-45 having the highest percentage of 34% and median age was 40 years, female patients were 122(61%), most patients were peasants 78(39%) with only 26(13%) having attended tertiary education.

Table 1: Socio demographic data

Age	**Frequency**	**Percentage (%)**
≤ 15	38	19
16-30	44	22
31-45	68	34
46-60	40	20
> 60	10	5
Gender		
Female	122	61
Males	78	39
Education level		
Primary	66	33
Secondary	80	40
Tertiary	26	13
None	28	14
Occupation		
Student	16	8
Peasant	78	39
Business	48	24
House wife	42	21
Civil servant	16	8

Marital status		
Married	80	40
Single	58	29
Widow	18	9
Divorced	44	22

Figure 1: The pie chart shows the percentage of HIV patients who turned smear positive for TB

From the study, it was found that 14% turned smear positive for TB and 86% were smear negative

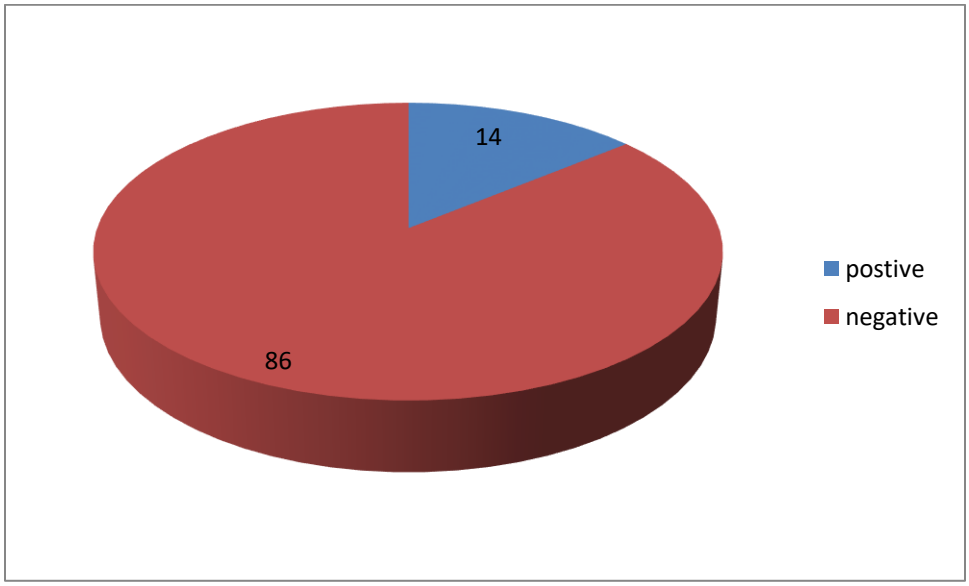
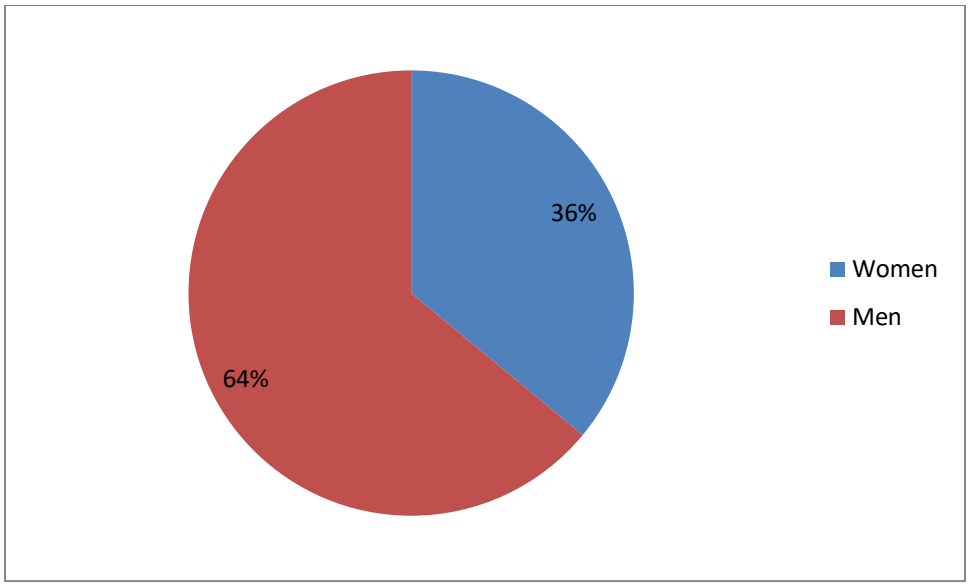


Table 2: A table showing the risk factors that predispose HIV patients to TB

From the table above, low CD4 below 250 was the highest predisposing factor of HIV patients to TB with 6(23%) followed by smoking with 3(16%).

	Yes		No		TB	
Risk factor	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Overcrowding	122	61	78	39	1	2
Smoking	36	18	164	82	3	16
Alcohol	84	42	116	58	2	5
TB contact	42	21	158	79	2	10
Low CD4 below 250	52	26	148	74	6	23

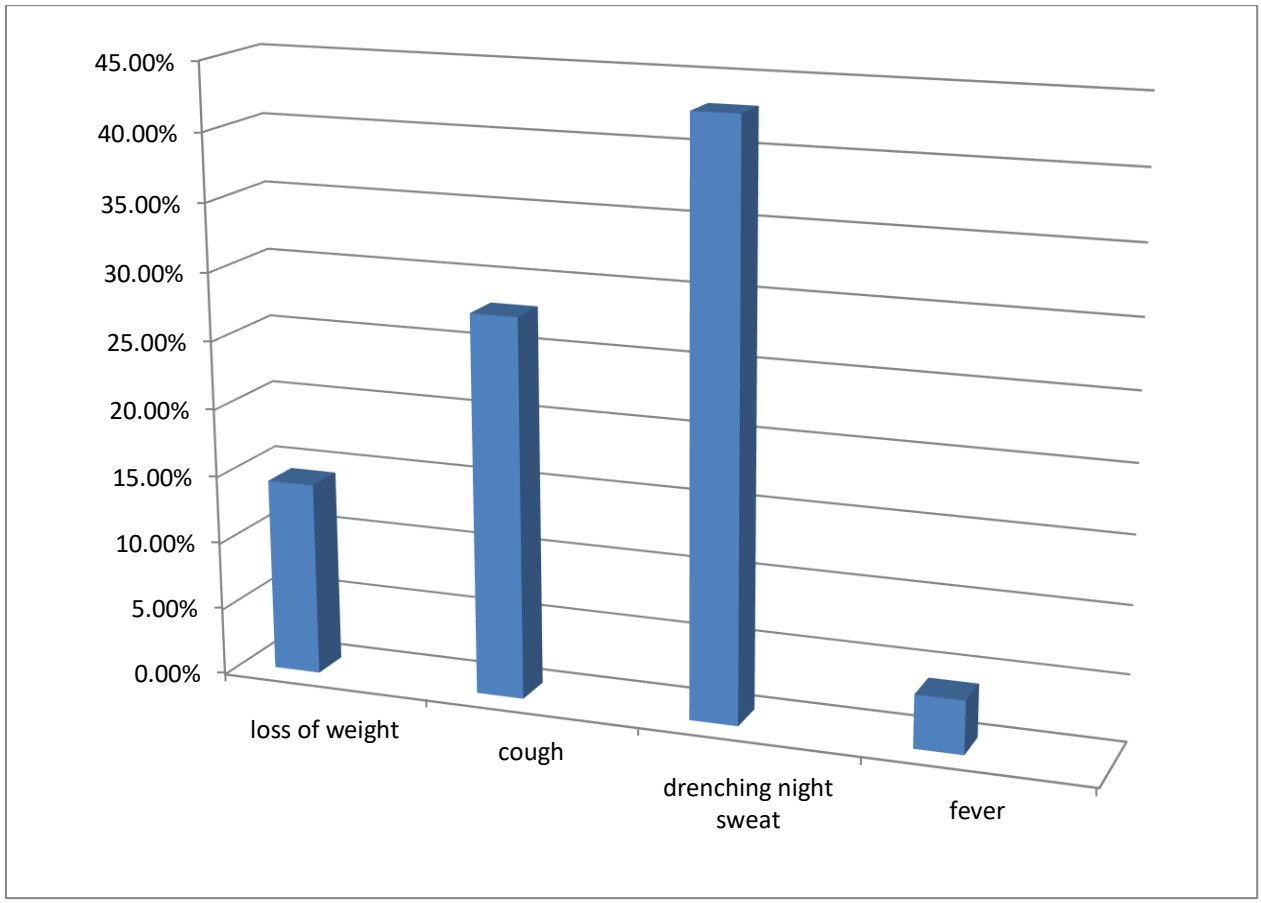
Figure 2: A pie chart showing the percentage of HIV/TB co infection by gender



From the chart above, men were found to have a high HIV/TB co infection with 64% and the women had a percentage of 36%

Figure 3 A graph showing the percentage of confirmed TB case according to clinical features.

According to the results it was found out that more patients with drenching night sweats had a highest percentage of smear positive(43%), followed by those with cough(28%), and fever had the least percentage(4%)



CHAPTER FIVE

5.0.0 DISCUSSION, RECCOMMENDATIONS, LIMITATIONS AND CONCLUSIONS.

5.1.0 Discussion of results

From the study results, the prevalence of TB among the HIV patients was found to be 14%, the results were similar to those found by (Fyrne et al., 2008).

5.1.1 Prevalence of tuberculosis with social demographic characteristics of respondents

Age

The disease diversity of TB varies substantially between different age groups. Those differences need clarifying because a better understanding of the immunological mechanism underlying disease and protection. Disease risk after primary infection with mycobacterium TB is greatest in children (below 4 years) and declines slowly to the age of 5-10 years. During adolescence,(15-19 years), there is a rapid increase in risk with a second peak between the ages of 20-30 years age related differences in disease risk are accompanied in the response to infection, clinical features also as age increases, there are other increased risk factors like occupation, other immune suppressive disease like diabetes, behavior such as smoking and increase contact from communities and prisons as evident by Kilenga et al., in a study on Tb risk factors among TB patients in Kampala.

HIV infection and aging affects the immunity in many similar ways, both resulting in reduced function and may result in to development of a more disseminated diseases as described by peter et al in the study on age and the epidemiology and pathogenesis of TB. The results are different from, those in this study and this could be due to the small number of the elderly that were included in the study.

Gender

In this study it was found that majority of the respondents (64%), who had HIV/TB co-infection were males and those results were similar to those found by Okodua 2014. This may be due to the fact that the predisposing factors for mycobacterium tuberculosis seem to favor the males more that the females especially in the developing countries in African where there is overcrowding and poor conditions in military camps, prison, construction sites, and factories are dominated by males as evident by Okodua et al 2014. There is also a difference in the social

behavior since smoking ad alcoholism is more common in men I a study done by Okodua et al. The incidence of HIV related pulmonary TB in Edo state in Nigeria, females were found to have a higher HIV/TB co-infection (11.6%) than males (7.7%). This can be due to the fact that there is a high percentage of HIV especially in the developing countries yet HIV is one of the major risk factors of TB and also there is a higher percentage of poverty and inequality among women especially in the developing countries.

5.1.2 Clinical features

Due to the difficulty experienced in resource limited settings which contributes to poor diagnosis and treatment access, there should be strengthening of symptom base diagnostic approach from the study of the total 28(14%) of confirmed TB case, 12(43%) had drenching night sweats followed by cough with 8(28.7%), the n loss weight and fever had the least specificity of 4(14.3%), from the study the combined presence of the four well defined symptoms of TB provided a good diagnostic approach to accuracy of in HIV patients .these findings coincided with Bacha et al., 2004. Mohammed et al in South Africa observed that among the patients with abdicated HIV disease not taking ART screening instrument of time or more symptoms was 100% sensitive and 88% specific with WPU of 100%. The higher the levels of sensitivity and specificity found in south Africa could be attributed to the small number of cases analyzed.

In hospitals in Tanzania and Burundi (Sant et al.) found out that the combination of any two of the symptoms (cough for 3 weeks and chest pain more than 15 days, absence of expectoration or absence of shortness of breath among adults had a sensitivity of 85% and a NVP of 90% however this study was limited to HIV infected patients. Several reports have described the characteristic clinical presentation of TB in HIV infected for instance up to 85% of HIV sero-positive patients from African have already experience a significant weight loss of more than 10kg or 20% of the body weight, when they are diagnosed with TB (Standect et al).

5.1.3 Risk factors

From the study it was observed that the highest percentage 6(23%) of HIV/TB co infection was observed in patients with a low CD4 count below 250 cells, these results conceded with those of kilenga et al(2015), low CD4 cells in HIV-infected persons indicate severely depressed immunity that makes them susceptible to fresh TB infection and rapid degradation of the clinical condition, it has already been established that TB attributed to six to seven fold increase of viral

load in HIV positive population, unlike cryptococcal meningitis or toxoplasmosis, which occur at a very low CD4 counts, < 250 cells/µg. There was also a high association between tuberculosis and smoking (16%), these findings were similar with those that were found by Kirenga et al(2015) in a study on tuberculosis risk factors among TB patients in Kampala, but differs from a study that was done in south Africa that reported 21.8% prevalence(Leuwagie and Yusuf 2013), in another study in Malaysia reported a prevalence of 40.3%. these differences could be due to the background of smoking prevalence in the general population. Tuberculosis contact was another factor with a prevalence of 10%, these results were similar to those that were found by Crampin et al (2006) in Malawi were close contact was estimated to account for 9-13% of the tuberculosis cases, in Uganda tuberculosis prevalence is 175/ 100,000 population(0.02%)(Global TB control report, 2012), it follows therefore that TB prevalence among patients among contacts is very high which calls for interventions of tuberculosis contact investigations and TB prophylaxis with Isoniazid in those at a high risk especially children. Alcohol as another investigated factor showed the least association of 5%, alcohol use was reported by 84(42%) of respondents and majority of alcohol users were men belonging to catholic and Anglican, moslems and orthodox communities were protective, in a study done in Kampala on alcohol consumption among HIV infected persons(Wandera et al,2013)

Overcrowding

Overcrowding was the least contributing factor associated with HIV/TB co-infection from the study with only 2%. This could be due the fact that most people who lived in overcrowded houses had no contact with a patient with active TB. There is an increase in TB risk in people living in poor conditions and overcrowding e.g. in hostels, prisons, refugee camps and rented houses. According to Schwitter et al, TB prevalence in Ugandan prisoners was 654 per 100000 populations, 3.5 times the prevalence of the general Uganda population 175/100,000(Global TB report 2012)

5.2.0 CONCLUSION

Since the increase in HIV infection rate leads to increase in TB disease, there is need to re-examine the strategies for their control, the development of programs with an integrated approach to inducing behavioral change and promoting condom use may reduce the infectivity of HIV transmitters and the susceptibility of HIV exposed persons. The most important aspect of

this control program is public awareness and health education on how TB and HIV are transmitted

The strength of this study included the use of clinical history with microbiological investigations for TB and CD4 among all the participants, I was therefore able to identify and exclude participants with active TB disease

5.3.0 RECOMMENDATIONS

- Therefore from the observations made in this study, all patients attending HIV clinic should be tested for TB infection. This will help to improve the quality lives of patients with HIV infection and also control transmission of TB to other people living with those patients, prompt diagnosis, adequate and correct treatment, high standards of hygiene and avoidance of overcrowding are some of the interventions that could be emphasized in the control and prevention of TB.
- Above all since the problems of TB and other opportunistic infections were reported to be increased by HIV/AIDS., there is need for constant review and modification of the components of HIV prevention. those components may include plans developed to achieve HIV prevention goals in the communities, mass awareness campaigns among the patients and their families, education and training of instructions poor groups and medics and other workers serving the communities, behavioral change communicating, HIV screening through routine counseling and testing(RCT), HIV/AIDS surveillance, sexually transmitted infections(STIs) management, prevention of exposure at work places, policies and procedures concerning social factors and management of HIV positive people and their families.

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APPENDICES

APPENDIX I: STUDY QUESTIONARE

Section A .Consent

I am MUKAIRE HUMARI ,a third year student doing a diploma in clinical medicine and community health at Kampala International University –Western Campus(KIU-WC) doing a study of prevalence of pulmonary tuberculosis among HIV/AIDS patient in Pallisa General Hospital .

Your participations in this study is completely free and voluntary .You have a right to say no or change your mind and withdraw at any time .Whether you choose to participate or not it will have no effect on the services to be given to you .All information that is to be obtained from you in this study will remain confidential and will only be disclosed with your permission.

I hope that this information will be used to draw intervention on prevalence of pulmonary tuberculosis in HIV/AIDS patients.

Name of investigator.

.....

Signature.

.....

Date.

.....

Section B: Socio-demographic profile of the volunteer.

AGE	
GENDER	
EDUCATION LEVEL	
OCCUPATION	
MARITAL STATUS	

SECTION C: Risk factors of TB among HIV patients (tick appropriately)

1. Are there any known TB patients in the family?

   Yes ☐ No ☐

2. Do you have any member of your family with previous (past 5years) or current Open tuberculosis?

   Yes ☐ No ☐

3. Have you done any tuberculosis test in the last 3 weeks?

   Yes ☐ No ☐

   If yes, what were the results?

   Positive ☐ Negative ☐

4. When were you diagnosed with HIV?

   .....

5. Were you commenced on ART immediately after diagnosis?

   Yes ☐ No ☐

6. Ifyes, which drugs were you initiated on?

   .....

7. How many people stay in the same house with you?

   ……

8. Do you smoke?

   Yes ☐ No ☐

9. Do you drink alcohol?

   Yes ☐ No ☐

10. Which type of house do you sleep in?

Permanent ☐ Semi- permanent ☐

12. Do health workers follow you up treatment of your disease?

Yes ☐ No ☐

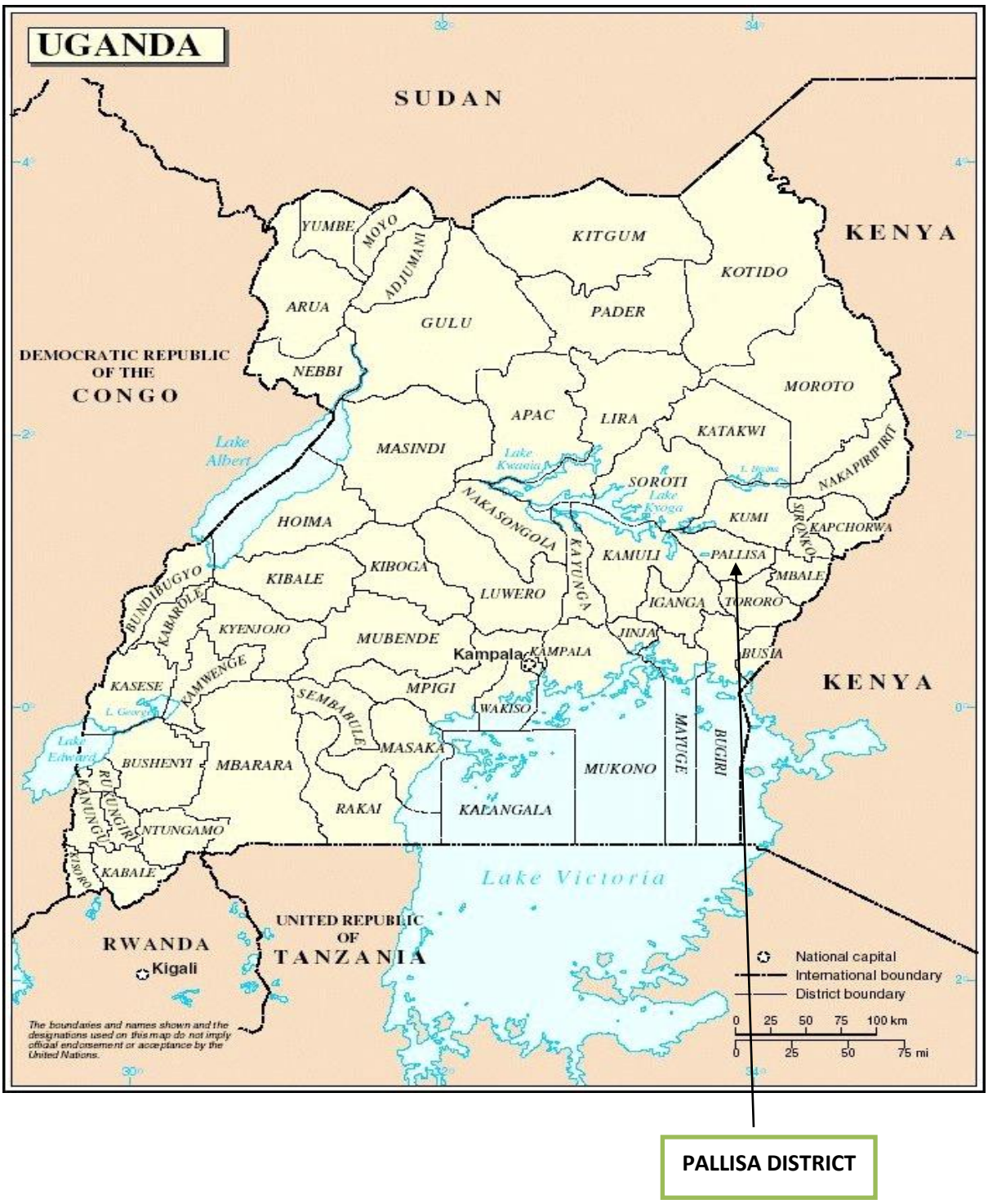
SECTION D: Clinical features of TB among HIV patients

Loss of weight	
Cough for two weeks	
Drenching night sweats	
Loss of appetite	
Fever for two weeks	

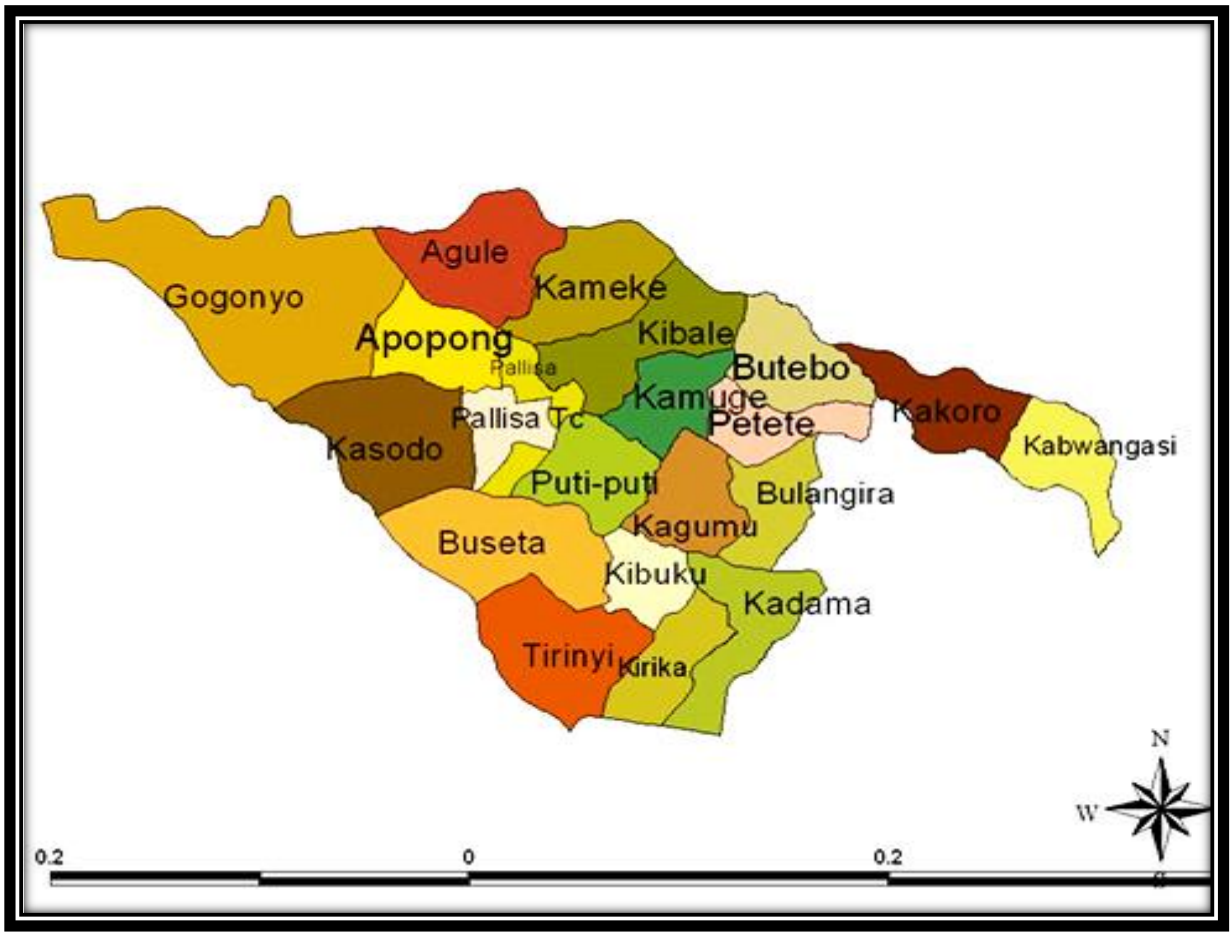
SECTION E: To be filled in correspondence with lab results.

Investigations:	Positive	Negative
Sputum analysis		
Aspirates for AFB microscopy		

APPENDIX II: A MAP OF UGANDA SHOWING PALLISA DISTRICT



APPENDIX III: A MAP OF PALLISA DISTRICT.



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