PREVALENCE OF MALARIA AMONG HIV/AIDS PATIENTS ATTENDING HIV CLINIC AT ISHAKA ADVENTIST HOSPITAL IN BUSHENYI DISTRICT

BY

NASSUNA RITAH

DCM/0068/143/DU

A RESEARCH REPORT SUBMITTED TO THE SCHOOL OF ALLIED HEALTH SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A DIPLOMA IN CLINICAL MEDICINE AND COMMUNITY HEALTH AT KAMPALA INTERNATIONAL UNIVERSITY

JULY2017

DECLARATION

This serves to declare that I **NASSUNA RITAH** have done my research report work which I have developed with my own effort and therefore I submit it to Kampala international university for a diploma in clinical medicine and community health.

….....

Signature

.....

Date

Name: NASSUNA RITAH (STUDENT)

APPROVAL

This serves to certify that the student Nassuna Ritah has done her report under my supervision and I therefore approve it.

....

Signature Date

Mr. MBURUGU MARTIN

T/ASS'T KIU - TH

ACKNOWLEDGEMENT

I am grateful to the following people who contributed in one way or another to the success of this study;

I thank the Kampala International University staff and administration for their co-operation during the research period.

My sincere gratitude goes to my supervisor, Mr.Mburugu Martin, who sacrificed his time and expertise to guide me during the research process.

My parents who have always been very supportive and friends who also assisted in data collection and analysis.

DEDICATION

I dedicate this project to my parents; MR & MRS LUBEGA PAUL my siblings and friends most especially Katamba Andrew and Bogere Solomon who have all been of great help spiritually, financially and emotionally.

Above all, my gratitude goes to the Almighty God for the far he has brought me.

LIST OF ABBREVIATIONS

ACTs	Artemisinin Based Combination Therapy
DALYs	Disability Adjusted Life Years
HAART	Highly active anti retro viral therapy
HIV	Human immunodeficiency virus infection
IAH	Ishaka Adventist Hospital
IDI	Infectious Disease Institute
IL	Interleukin
ITNs	Insecticide-treated mosquito nets
MOHsw	Ministry of Health and Social Welfare
MOP	Malaria Operational Plan
NIMR	National Institute of Medical Research
NMCP	National Malaria Control Program
NMTSP	National Malaria Medium Term Strategic Plan
RBM	Roll Back Malaria
RDTs	Rapid Diagnostic Tests

OPERATIONAL DEFINITIONS

End emicity: The quality or state of being endemic.

Epidemic: Affecting or tending to affect an atypically large number of Individuals within a population, community, or region at the same time.

Holo-endemic: endemic at a high level in a population, affecting most of the children and so affecting the adults in the same population less often.

Hyper- endemic: An area exhibiting a high and continued incidence—used chiefly of human diseases.

M**alaria epidemic:** Is defined as an abrupt increase in Malaria transmission that exceeds by far the inter-seasonal variation normally experienced in a given area and often associated with increased morbidity and mortality.

Stable malaria transmission: Areas with a stable transmission have a persistent transmission and hence prevalence of infection.

Unstable malaria transmission: In areas with an unstable malaria transmission the prevalence of infection varies highly over time and space.

Table of Contents

ABSTRACT

The study assessed the prevalence of malaria in HIV/AIDS patients attending HIV clinic at Ishaka Adventist Hospital, the study objectives were to determine the proportion of HIV patients with malaria, to identify the clinical manifestations of malaria among HIV positive patients and to review different techniques used in diagnosis of malaria at Ishaka Adventist Hospital in Bushenyi district.

A descriptive cross sectional study was used for known HIV positive patients attending Ishaka Adventist Hospital and involved systematic random sampling of participants.

The study found out that malaria prevalence was high among HIV patients at 9.8%, nearly all patients who were diagonised with malaria reported having had fever previously 87.1% , the presentation of malaria can better be assesed as uncomplicated malaria and complicated malaria and in this study majority of the signs assessed were of uncomplicated malaria, diagnostic measures of laboratory remain the most perfect way of diagnosing malaria other than clinical assessment especially in HIV patients who are immunocompromised nd can be ill of various oppotunistic infection.

In conclusion although various methods have been advanced to curb malaria epidemic , the prevalence is still high, so the the following are recommendation; the government should distribute more mosquito nets especially those whoare immunocompromissed like HIV patients, agencies for fighting malaria and those of HIV should work together inorder to reduce the number of HIV patients getting malaria infection, patients should be health educated on the main signs and symptoms of malaria such that they can quickly seek medical attention incase of the need, patients should be encouraged to take their ARVs to maintain their immunity relatively high so that they are not severely affected by malaria

CHAPTER ONE

1.0 INTRODUCTION

1.1 Back ground of the study

Two of the greatest challenges facing Africa today are human immunodeficiency virus (HIV) infection and malaria, yet the interaction between these two infections has been little studied. An interaction between HIV infection and malaria could work in either direction, i.e. HIV infection might reduce immunity to clinical malaria resulting in more frequent infection among the semi-immune and non-immune, or malaria might enhance the progression of HIV infection to clinical AIDS (Chandramoham D, Greenwood BM 2008).

Sub-Saharan Africa has >70% of the over 42 million persons infected with HIV/AIDS worldwide and it is now the leading cause of death in the region. Nigeria, the most populous country in Africa, has over four million persons living with HIV/AIDS and a national seroprevalence of 5.8% at the end of 2001(Akinsete I, 2012), with the north-central region harboring the highest HIV infection levels in the country (walker O et al., 2006).

Various reports stated that malaria is a powerful stimulator of the immune system and the subjects exposed frequently to malaria have enhanced serum levels of immunoglobulin and an accelerated rate of IgG turnover. (Thomas J et al., 2005)

Other authors (Whittle HC and Brown J brown 2008) also reported that malaria infection might have an adverse effect on HIV infection both by stimulating T-cell turnover and by impairing T-cell cytotoxic function.

Malaria parasitaemia differs in instances of asymptomatic and clinical malaria, and the degree of parasitaemia may influence the pathological and biochemical presentations of individuals presenting with either of these conditions(Monn R et al., 2009) Reports have shown that in clinical cases of malaria, anemia is a prominent factor(Thornhamm, 2010), which is possibly caused by destruction of infected blood cells by the reticulo-endothelial system and hemolysis of infected cells(Sata T et al., 2004)

1.2 Problem statement

Human immunodeficiency disease (HIV) and malaria infections often coexist in patients in many parts of the world due to geographic overlap of these two diseases. This is particularly true in sub-Saharan Africa, where an estimated 40 million people are living with HIV and more than 350 million episodes of malaria occur yearly(Goselleetal., 2007).

There is also evidence of a negative interaction between these two infections. HIV increases the risk of malaria infection. There are five malarial species that infect humans. Presently, most data on HIV interaction with malaria are derived from P. falciparum endemic regions of sub-Saharan Africa. However, as HIV spreads to areas endemic for Plasmodium vivax, similar important interactions may be identified. Immunity to malaria is characterized by an age-related reduction in parasite burden, clinical symptoms, and prevalence of severe disease in individuals residing in an endemic area. Plasmodium falciparum infection and the burden of parasitaemia are often less severe in older adults than in children. Children are at increased risk since they have not yet acquired natural immunity; pregnant women transiently lose some of their acquired immunity due to the relative immunosuppression of pregnancy. The degree of immunity is also related to transmission intensity, which varies geographically.HIV-related immune suppression diminishes this acquired immunity(Mouala, 2013).

These two infections interact bidirectional and synergistically with each other. HIV infection can increase the risk and severity of malaria infection and the increased parasite burdens might facilitate higher rates of malaria transmission. Individuals in malaria-endemic areas that are considered semi-immune to malaria can also develop clinical malaria if they are infected with HIV. Also malaria infection is associated with strong CD4+ cell activation and up-regulation of proinflammatory cytokines, providing an ideal microenvironment for the spread of the virus among CD4 + cells and thus for rapid HIV-1 replication (Corbett, 2012).

1.3 Study Objectives

1.3.1 General objectives.

- To determine the prevalence of malaria among HIV patients attending Ishaka Adventist Hospital in Bushenyi district.

1.3.2 Specific objectives

1. To determine the proportion of HIV patients with malaria attending Ishaka Adventist Hospital.
2. To identify the clinical manifestations of malaria among HIV positive patients attending HIV clinic at Ishaka Adventist Hospital.
3. To review different techniques used in diagnosis of malaria at Ishaka Adventist Hospital.

1.4 Research questions.

1. What is the proportion of HIV patients with malaria attending Ishaka Adventist Hospital?
2. What are the clinical manifestations of malaria among HIV positive patients attending HIV clinic at Ishaka Adventist Hospital?
3. What are the different techniques used in diagnosis of malaria at Ishaka Adventist Hospital?

1.3 Study justification

HIV/AIDS is a major public health problem in Uganda. The overall national HIV Seroprevalence is 6.4 % in adults according to the national sero survey (UDHS, 2010) and a study in Mulago hospital in 2004 found a sero prevalence of 6.8% among patients attending the outpatient clinic, although different comparative studies between HIV and malaria co infection have been done, little literature has been availed in Ishaka Bushenyi Municipality and so the study to determine the prevalence of malaria among HIV patients attending Ishaka Adventist Hospital can bridge this gap.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

Malaria is a mosquito-borne disease of humans, caused by protozoa belonging to the genus Plasmodium. There are 5 species of Plasmodium that can infect humans that is; P. falciparum, P. vivax, P. ovale, P. malariae and P.knowles. P.knowles was found in Thailand during 2006-2007 at approximately 0.8% of all malaria cases identified even though it is the dominant strain in Malaysian Borne (Buppan P 2011).

The most severe malarial infection in human is due to P. falciparum. The parasites are transmitted to people through the bites of infected Anopheles mosquitoes (Supavej S et al 2006). Symptoms of malaria include fever, headache and hemolysis, in severe cases anemia and potentially death despite several drugs available for treating malaria infection such as; chloroquine, quinine, mefloquin, and artesunate (WHO,2006).

The World Health Organization (WHO) currently recommends Artemisinin-based combination therapies (ACTs) as the best first-line treatment for uncomplicated P. falciparum (Krudsood 2007). This disease remains a severe global public health problem while WHO promotes guidelines on prevention and control practices. The prevention and control programs induce health care costs, investment costs, and loss of tourism. Malaria infections are common in poverty stricken countries with poor education, especially in Africa. The incidence rates of malaria infection in Africa, Asia and North America are about 59%, 38% and 3%, respectively. P. falciparum accounts for up to 74% of malaria in Africa, and only about 1% in Asia (WHO, UNICEF 2005).

However, malaria is still viewed as an important health problem in Thailand. In 2008, southern Thailand suffered an outbreak of malaria [Singh B, 2008]. During 2005 to 2009, Vibhavadi was among the top five districts in SuratThani Province, with a high incidence of malaria infections (Lester RT, Morris CN2012).

2.1 Prevalence of malaria among HIV patients.

Malaria and HIV are among the most prevalent diseases in the world. It is estimated that about 350-400 million people have clinical episodes of malaria annually and about 2.7 million 1people die of malaria annually(Wariso KT 2007).

It is also estimated that about 33 million people are living with HIV/AIDS globally with 2.7 million new cases and 2.1 million deaths annually. The majority of the new infections of HIV occur in the adolescent group and young adults (15-24 years). It was estimated by UNAIDS that about 3.9% of Nigerian adults live with HIV/AIDS(UNAIDS 2011).

More than three quarters of the death due to malaria occur in Sub Saharan Africa. This usually constitutes a drain of resources of about $2 billion USD annually due to the effect it has on the production cost of health services. It is also worthyof note that Sub Saharan Africa is home to about 25 million adults and children living with HIV/AIDS (Lugada 2013).

Some schools of thought are of the view that malaria is over diagnosed in Africa due to much emphasis placed on clinical diagnosis with little or no laboratorycomponent.

There are presently five major species of Plasmodia that attack man, leading to the malaria disease. These are Plasmodium falciparum, Plasmodium ovale, Plasmodium vivax, Plasmodium malariae and Plasmodium Knowles. Each species differs widely in morphology, characteristics, geographical distribution and clinical presentations(Niyongabo 2013).

Malaria is endemic in Nigeria and other Sub-Saharan Africa due to the year round presence of Plasmodium falciparum and the efficient transmission by its mosquito vectors Anopheles gambiae and Anopheles funestus (Akinsete I, 2012).

Owing to the overlapping distribution of HIV and malaria, interactions between them are likely. However, studies have shown conflicting reports. There has been controversy whether there is even any relationship between them.

Igbeneghu et al found a relationship between the two infections in a study from South West Nigeria. They noted that HIV infection increases the prevalence of malaria. The observation of a marked reduction in the prevalence of malaria parasitaemia and anemia in HIV infected pregnant

women receiving cotrimoxazole with or without sulfadoxinepyrimethamine intermittent preventive therapy in pregnancy has also been reported in Malawi.

It has now been established that HIV affects the susceptibility to malaria, its clinical course and also impairs antibody responses to malaria antigens. What is also known is that HIV 1 infection affects malaria humoral immunity during pregnancy, but data for non- pregnant females are lacking.

The gold standard test for malaria diagnosis is microscopic examination of Giemsa stained thick and thin blood smears. Although this method is a fast and inexpensive diagnostic procedure, it is largely dependent on the competence of the microscopy. Achieving high sensitivity requires counting up to 100 microscopic fields which is time and labor intensive. Serological test have recently been established as alternative methods to conventional microscopy for the diagnosis of malaria. Immunochromatographic methods can detect antigen and antibody reliably and can be quite specific for malaria(Uneke CJ 2005).

In Uganda, Muller and Moser, found no relationship between malaria and HIV infection and reported a prevalence of 18% among general adult patients. On the other hand, Francine H, et al noted a higher prevalence rate of 25.6% of malaria among HIV infected pregnant women in Uganda.

2.2 Clinical Features

The incubation period of malaria ranges from 10 to 14 days depending on the parasite species. The first attacks are usually more severe and may persist for weeks, if untreated. Malaria infection is a serious condition that can lead to severe malaria or death if treatment is delayed. Relapse occurs when parasites persisting in the liver reinvade the bloodstream this is common with P. ovale and P. vivax(Muema DK, 2011).

The onset of malaria caused by P. falciparum may be challenging to diagnose. It is characterized by fever, which may be continuous, recurring, or irregular. If the acute attack is treated rapidly using effective medicines, the disease is usually mild and recovery uneventful. If inadequately treated in an individual, sequestration of infected red blood cells in the deep tissues can cause serious complications leading to severe malaria and death (Moody A. 2012).

In areas of intense transmission such as Zambia, P. falciparum among HIV seropositive patients is also dangerous to other categories including the mother,the unborn baby and children under five and visitors from areas of low or no malaria transmission. Guidelines for the diagnosis and treatment of malaria in Zambia (Francesconi P, 2011).

Malaria may manifest clinically either as an acute uncomplicated disease or as severe malaria. In areas of intense transmission, high proportions of infected persons have partial immunity to malaria and are often asymptomatic. A careful assessment of the patient with suspected malaria is essential in order to differentiate between the acute uncomplicated and severe disease, as this has therapeutic and prognostic implication (Muller O, et al 2010).

Clinical Manifestations Clinical manifestations may be categorized into symptoms of uncomplicated malaria and those of severe malaria. Uncomplicated Malaria Early symptoms are usually non-specific and are often characterized by intermittent febrile illness. Fever is the most common symptom. Headache, aching joints, back pain, nausea, vomiting, and general discomfort usually accompany fever. It should be noted that the patient may not present with fever but may have had a recent history of fever. This is due to the natural malaria cycle (Howard RJ 2007).

A history of fever during the previous two days along with other symptoms of malaria is a clinical basis for suspecting malaria. It is equally important to note that fever is a common Guidelines for the Diagnosis and Treatment of Malaria in Zambia symptom for other infections besides malaria, such as ear infections, measles, and respiratory infections (Grobusch MP,2006).

The possibility of other infections, either co-existing with malaria or as the sole cause of fever, should always be borne in mind when determining the diagnosis. It is therefore important to exclude other causes of fever (Van Geertruyden, 2009).

In HIV seropositive patients, other symptoms following onset of malaria may be characterized in the early stages only by symptoms like poor appetite, restlessness, cough, diarrhea, malaise, and loss of interest in the surroundings. Severe Malaria P. falciparum infection in the presence of any life threatening condition is considered as severe malaria (Jongwutiwes S, 2004).

Some of the life-threatening conditions include signs and symptoms such as: Cerebral malaria, defined as coma not attributable to any other cause in a patient with P. falciparum malaria, Generalized convulsions (more than two episodes within 24 hours),Coma or altered level of

consciousness, Drowsiness or lethargy,Prostrationinabilityto sit or stand without support Guidelines for the Diagnosis and Treatment of Malaria in Zambia ,Acute pulmonary edema (adult respiratory distress syndrome),Hypotension and shock (systolic blood pressure of less than 50 mm Hg in children 1–5 years of age and less than 80 mm Hg in adults (cold moist skin, low blood pressure, collapse),Persistent/excessive vomiting, Abnormal bleeding (spontaneous or prolonged bleeding from puncture sites (Singh B, Kim SL 2009).

In related studies other medically identified symptoms include Fluid and electrolyte disturbances, Acute renal failure (failure to pass urine or passing very little urine—less than 400 ml in 24 hours in adults and less than 2 ml per kg in 24 hours in children, Jaundice(Kim SL et al 2009)

In addition, relevant laboratory indicators include,Hyperparasitaemia (proportion of parasitized red cells >5% in the non-immune and >10% in the semi immune population),Acidosis (metabolic) (plasma bicarbonate <15 mmol/L),Severe normocytic anemia (hemoglobin <5g/dl or packed cell volume [PVC] < 15%),Hyperlactatemia (lactate >5 mmol/L) Guidelines for the Diagnosis and Treatment of Malaria in Zambia 14, Renal impairment (creatinine>265 µmols/L), Haemoglobinuria,Hypoglycemia ,blood glucose <2.2 mmol/L or <40 (Achidi EA 2007).

2. 3 Diagnosis

Early diagnosis and prompt effective treatment are of vital importance in the management of malaria. The signs and symptoms of malaria are nonspecific. Diagnosis based on clinical features alone has very low specificity and often results in over-treatment (Lee GR 2011).

Confirmatory diagnosis plays an important supportive role in clinical care. Diagnosis of malaria should be based on parasitological confirmation (laboratory). A careful medical history and a physical examination should be performed. A complete history should include common symptoms of malaria, age, place of residence, recent history of travel, previous treatment(s), and other illnesses. In children, refusal to eat or feed and decreased activity should be noted. A history of fever in the last 48 hours with or without other symptoms of malaria or a current history of fever (temperature ≥37.5°C) is adequate ground for suspicion of malaria but does not constitute a confirmatory diagnosis (Shentopn et al 2012).

A parasitological confirmation of malaria is recommended; it improves the differential diagnosis of fever, improves fever case management, and reduces unnecessary use of antimalarial

medicines. Antimalarial treatment on the basis of clinical suspicion of malaria should only be considered in situations where a parasitological diagnosis is not Guidelines for the Diagnosis and Treatment of Malaria in Zambia (Whittle HC 2008).

Parasitological confirmation (laboratory) is done by examining either a blood smear/slide or malaria RDT. Molecular testing can also be used to confirm a diagnosis of malaria. In the presence of suggestive signs and symptoms of malaria with negative microscopy or RDT results, a re-evaluation of the patient to rule out the presence of any other cause of fever for children under the age of five, further evaluation, classification, and treatment should be performed according to the IMCI guidelines (Greenwood BM 2008).

Confirmatory (Laboratory) Diagnosis, a parasitological confirmation of malaria improves the differential diagnosis of fever, improves fever case management, and reduces unnecessary use of antimalarial medicines. It also assists the health care provider to monitor the patient's response to treatment. Parasite density (particularly in areas of low endemicity) is an important indicator of severity of disease. However, in areas of high endemicity the general population may tolerate very high levels of parasitaemia with less severity in the clinical manifestation(McGrogor IA 2010).

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 area

The study was carried in Ishaka Adventist Hospital located in IshakamunicipalityIgara County, Bushenyi district in south western Uganda, Ankole sub-region. I t is approximately 62Km by road west ofMbarara the largest city in the sub-region along Kasese-Mbarara road. The 2014 Uganda Bureau ofStatistics showed that the total population of the town is 41063 people(UNBS 2014).

Bushenyi District lies between 00 N and 00 46' S of the equator and 290 41' East and 300 30' East of Greenwich. Its headquarters are located 340kms from Kampala in the South Western part of Uganda. It neighbors the districts of Rubirizi in the North, Buhweju and Sheema in the North East, Sheema in the East, Mitooma in the South West and Sheema in the South. The district has a land area of 3'949 square kilometers and lying between 910 – 2,500 meters above sea level and the main physical features within the district include natural tropical forests of Karinzu and Imaramagambo covering an area of 784 square kilo meters.

3.2 Study design

A descriptive cross sectional study was used for known HIV sero positive patients attending medical Ishaka Adventist Hospital and will involve systematic random sampling of participants. A cross sectional study was selected because one of the objectives of the study was to determine the proportion of patients with malaria among HIV sero positive patients attending Ishaka Adventist Hospital.

3.3 Sample Size determination

The sample size was determined using Fishers et al, 2003 formula .The formula wasused to estimate the smallest possible categorical sample size for the population for the patients attending medical wards at IAH, Bushenyi district.

$$n = \frac{z^2 p\,(1-p)}{d^2}$$

Where d = margin of error.

n= minimum sample size.

z=standard normal deviation set at 95% confidential level corresponding to 1.96.

p= expected prevalence (proportion).

Therefore taking

p = 18% = 0.18

z = 1.96

1-p = 0.5

d= 5% = 0.05

$$\text{Thus } n = \frac{(1.96)^2 X 0.13 \text{ X } (1-0.13)}{(0.05)^2}$$

n=194

Therefore the sample size will be 194.

3.4 Study population

The study was done among known HIV seropositive patients attending Ishaka Adventist Hospital Bushenyi district.

3.5 The sampling method

The study was carried out among patients who were attending IAH and a total of 59 were considered where all those who came within the time of the study were considered for an interview and caretakers or any elder participating in the study were considered to provide relevant information on behalf of the patients. And using random sampling method the participants in the study were chosen.

3.6 Inclusion and exclusion criteria

3.6.1 Inclusion criteria

The study included HIV patients that accepted to give consent, patients attending Ishaka Adventist Hospital.

3.6.2 Exclusion criteria

Patients that did not give consent for the interview were excluded from the study, patients who were too sick to participate.

3.7 Data collection method

3.7.1 Semi-structured questionnaire

A semi-structured questionnaire was designed to collect data on selected variables. Two research assistants were then trained on the questionnaire and assisted in piloting and subsequent collection of the main data. The variables of interest included age, sex, education, occupation, marital status, income among others. Also any history of fever, headache, and chills, joint were obtained.

3.7.2 Laboratory investigation.

After the questioner the patients were then be sent to the hospital laboratory for investigations where a blood smear for malaria parasites or An RDT strip used was used to diagnosis malaria.

After that the laboratory results were entered into a corresponding data correction sheet for the patient.

3.8 Data Analysis Method

The data collected from the study was computed using Microsoft excel. The analysis was made in line with the study objectives so as to achieve the purpose of the study and was presented inform of tables, pie-charts, bar-graph, and narratives depending on the data analyzed.

3.10 Study Limitations

Language barrier because not all respondents know English the official language and the commonly spoken language in the area is Runyankole.

Financial constraints because data collection required transport, stationary(appendix ii)

3.11 Data quality control

To ensure quality control, the researcher prior to the exercise conducted one day training for three research assistance who there-after will be set for field testing of the study tools . A total of six questionnaires will be distributed for the pre-test. The research assistants will be supervised closely by the principle invigilator himself.

3.12 Ethical Consideration

The study was carried out after of the university has approved it. An Introductory Letter from the Administrator school of Allied health sciences was obtained.The researcherobtainedpermission from the administration of KIU-TH through verbal informed consent. 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 by use of codes that will only be known by responsible parties other than use of names,and ensuring not to disclose their information to third parties without their consent. Participants were also informed that participation was absolutely voluntary and that they would be free to decline participation or stop at any time if they so wished.

CHAPTER FOUR:

RESULTS

4.0 Introduction

This chapter presents the Results, Analysis and interpretations of findings of the study according to the specific study objectives. Findings and results are presented in form of bar graphs, pie charts, tables and figures.

4.1 Study findings.

From the study conducted, the following results were obtained from a sample of 194 HIV patients who attended HIV clinic of Ishaka Adventist hospital.

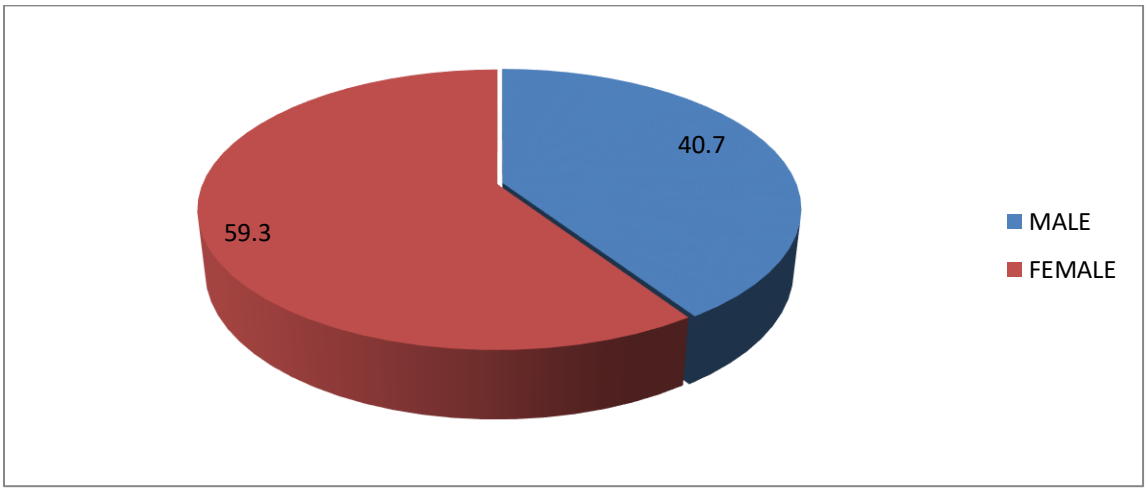
4.1.1 PART A: SOCIO AND DEMOGRAPHIC FACTORS

Table 1: Age distribution n= 194

Age(years)	**Frequency**	**Percentage**
<25	23	11.9
25-34	51	26.3
35-54	90	46.4
>54	30	15.5
Total	**194**	**100**

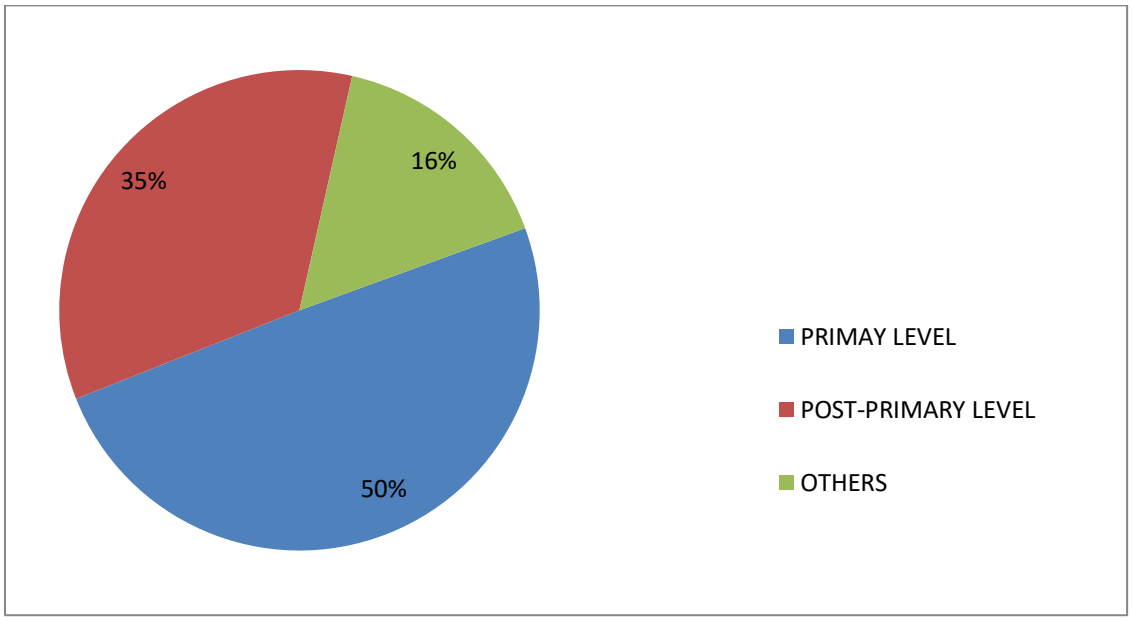
Majority of the respondents 90 (46.4%) were in the age bracket of 35-54, followed by those in 25- 34 years who were 52 (26.3%), 30 (15.5%) were above 54 years and 23 (11.9%) were below 25 years.

Fig 1 Gender of respondents.



Majority of the respondents 115 (59.3%) that were interviewed were females where as 79 (40.7%)of the respondents were males .

Fig 2:Level of Education of these respondents.



The majority of the respondents stopped at primary level 96,(49.5%) commonly between P.5 and P.7, 67 (34.5%) had studied beyond primary level including those who reached secondary school

and tertiary institutions,31 (15.9%) had other levels of education among them were those who had never attended school.

Table 2: Occupation of the respondents, n= 194

Occupation	**Frequency**	**Percentage(%)**
Unemployed	13	6.7
Peasant farmer	93	47.9
Business man/woman	33	17.0
Student	18	9.3
Others	37	19.1
Total	**194**	**100**

Most of the patients, 93 (47.9%) were peasant farmers, 33 (17.0%) were business men and women, 37 (19.1%) were doing other forms of occupation, 18 (9.3%) were students and only 13 (6.7%) were unempolyed.

Table 3:Marital status of respondents,n =194

Marital status	**Frequency**	**Percentage(%)**
Single	67	34.5
Married	102	52.6
Others	25	12.9
Total	**194**	**100**

Majority of the respondents, 102 (52.6%) were married followed by those who were single, 67 (34.5%) and finally, 25 (12.9%) who were belonging to other status such as those that had separated and widowed.

Table 4: Tribe of respondants (n= 194)

Variable(Tribe)	frequency	Percentage(%)
Munyankole	113	58.2
Mukiga	43	22.2
Others	38	19.6
Total	**194**	**100**

The majority of the patients who were interviewed were Banyankole 113 (58.2%), 43 (22.2%) were Bakiga, and 38 (19.6%) were belonging to other ethinicity such as the Batoorro, Baganda and Bakonzo.

4.2 PREVALANCE OF MALARIA

Table 8: To show the prevalence of malaria in the study patients.

Investigation	Results		
	Postive	**Negative**	**Percenatge(%)**
Blood smear for malaria parasites	19	175	9.8%
Rapid diagnostic test	12	182	6.1%
Total	**31**	**357**	**15.9%**

The prevalence/frequence of malaria is shown in table .Out of 194 patients enrolled in the study, a total of 19 were diagnosed with malaria using blood smear for malaria parasites 5 cases higher than those of rapid diagnostic test who were only twelve

An overall prevalence of malaria among a total 194 HIV seropositive patients was 9.8% was observed from the study participants during the study period. From these majority were diagnosed using microscopy technique.

4.3 CLINICAL MANIFESTATIONS OF MALARIA

Table 6:Clinical manifestation of malaria among HIV patients.

Clinical manifestation	**Patient's response**	**Frequence**	**Percentage(%)**
Fever	Yes	24	87.1
	No	7	12.9
Headache	Yes	23	74.2
	No	8	25.8
Joint pain	Yes	16	51.6
	No	15	48.4
General malaise	Yes	11	35.5
	No	20	64.5
Vomiting and diarrhea	Yes	9	29
	No	22	71
Back pain	Yes	13	41.9
	No	18	58.1
Reduced appetite	Yes	24	77.4
	No	7	22.6

From the study conducted out of the 31 patients who had been diagnised withmalaria, 24 (87.1%)reported to have had Fever before while 7 (12.9%) said they had not experienced any Fevers, also 23(74.2%) of the patients reported having experinced Headache prior to coming to

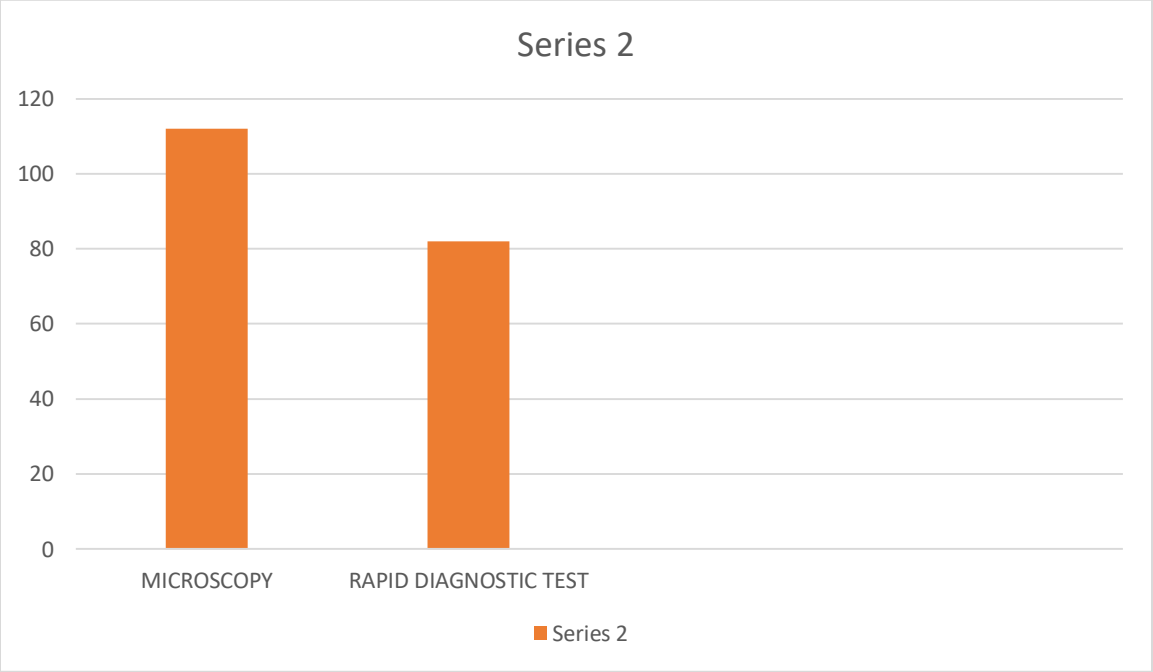
the hospital,8(25.8%) of the patients diagnosed acknoweledged not to have had Headache prior to yheir coming totha hospital.

Also to note is that from the study 16(51.6%)of the patients reported to have experinced Joint pains before coming to the hospital while 15(48.4%) reported not to have experienced anyJoint pains even prior to coming to the hospital. More so from the table above of results, 20(64.5%)of the patients reported to have had general body weakness as compared to 11 (35.5%)who reported not to have experinced any general weaknesses. Also to note is that 9(29%) of the patients diagnosed with malaria reported to have experinced some Vomiting and diarrhea before coming to the hospital as compared to the 22(71%) never experinced any vomitting or diarrhea . On the other hand 13(41.9%) of the patients reported to have had Back pains while 18(58.1) said they had not experienced any thing to do with Back pain.Lastly out of the 31 patients diagnosed of malaria, 24(77.4%) reported to have experinced Reduced appetite while 7(22.6%) said they never experinced any reduced appetite.

4.4 DIAGNOSTIC TECHNIQUES FOR MALARIA

Table 7:

Identification of techniques used in diagnosis of malaria at Ishaka Adventist Hospital.



From the bar graph above, of the HIV sreopositive patients that were diagnosed with malaria, majority of them 112 (57.7%) were diagnosed using the laboratory technique of microscopy which involves a blood smear for malaria parasites. Whereas 82 (42.3%) were diagnosed using a strip of an RDT test.

CHAPTER FIVE:

DISCUSSION.

5.0 Introduction

This chapter includes disussion of results, conclussion and reccommendations made. The discussion is correhent with the specific objectves which were to determine the proportion of HIV patients with malaria attending Ishaka Adventist Hospital, to identify the clinical manifestations of malaria among HIV positive patients attending HIV clinic at IAH and to review different techniques used in diagnosis of malaria at IAH. Social demographic characteristics have been included because they are directly associated with lives of individuals.

5.1The prevalence/frequence of malaria is shown in table

On the prevalence of malaria, Out of 194 patients enrolled in the study, a total of 31 were diagnosed with malaria using both blood smear for malaria parasites and rapid daignostic test.An overall prevalence of malaria among a total 194 HIV seropositive patients was 9.8 was observed from the study participants during the study period using a blood smear microscopy. From these majority were diagnosed using micrscopy technique. Microscopy was used as a better option because it could help also to identify the species most common in causing malaria.

The 15.9 prevalence is comparingly also high as compared to the related studies of Muller and Moser who had projected their prevalence in uganda at 18% in 2010.

5.2. clinical presentation of malaria among HIV patients

From the study conducted out of the 19 (9.8%) patients who had been diagnised withmalaria using a blood smear microscopy tecnnique, 24 (87.1%) reported to have had Fever before while 7 (12.9%) said they had not experienced any Fevers, also 23(74.2%) of the patients reported o have experinced Headache prior to coming to the hospital,8(25.8%s) of the patients diagnosed acknoweledged not to have had Headache prior to yheir coming totha hospital. A bigger percentage presenting with fever indicates that fever is a cardinal sign of malaria and is very significant in its cinical assessment in related studies Van Geerttruyden in 2009 cited that

presence of fever in malaria patients who are HIV sero positive is usually aggreaviated by co infection with other infections.

Also to note is that from the study 16(51.6%) of the patients reported to have experinced Joint pains before coming to the hospital while 15(48.4%) reported not to have experienced anyJoint pains even prior to coming to the hospital. More so from the table above of results, 20(64.5%) of the patients reported to have had General body weakness as compared to 11 (35.5%) who reported not to have experinced any general weaknesses. This can be attributed to the fact that many red blood cells are destroyed and so less oxygen is transported to thetissues to produce enough body enough to run daily activities. Also to note is that 9(29%) of the patientients diagnosed with malaria reported to have experinced some Vomiting and diarrhea before coming to the hospital as compared to the 22(71%) never experinced any vomitting or diarrhea . According to Howard RJ in 2007 he identified a normal malaria as involving joint pains, nausea, vomiting among others.

On the other hand 13(41.9%) of the patients reported to have had Back pains while 18(58.1) said they had not experienced ny thing to do witth Back pain.Lastly out of the 31 patients diagnoseed of malaria, 24(77.4%) reported to have experinced Reduced appetite while 7(22.6%) said they never experinced any Reduced appetite. These were already cited in previous studies by Muller O et al in 2010 as beingthe clinical manifestations of uncomplicated malaria.

5.3 review of diagnostic techniques in malaria diagnosis

From the study on malaria diagnosis of the HIV sreopositive patients that were diagnosed with malaria, majority of them 112 (57.7%) were diagnosed using the laboratory technique of microscopy which involves a blood smear for malaria parasites. Whereas 82 (42.3%) were diagnosed using a strip of an RDT test. Although Rapid Dignostic Test is faster , microscopy is better because it can alsso identify which species of plasmodium species if commonest and this would help in management.

5.4 conclusions.

Malaria prevlence was high among HIV patients so an urgent intervation should be sought.

Nearly all patients who were diagonised with malaria reported having had fever previously and so fever remains a cardinal sign in identifying patients with malria.

The presentation of malaria can better be assesed as uncomplicated malaria and complicated malaria and in this study marjority of the signs assessed were of uncomplicated malaria.

Diagnostic measures of laboratory remain the most perfect way of diagnosing malaria other than clinical ssessment especially in HIV patients who are immunocompromised nd can be ill of various oppotunistic infection.

However in some instances a patient who took antimalarials prior to coming to the hospital may not give proper results and therefore a patient with clinical manifestation of malaria roling other infection of malaria like presentation should be iniated on antimalarials.

Malaria can have life threatening complications which may present with reduced consciousness such as cerebral malaria and in such incidences a quick intervetion is needed.

5.5 recommendations.

The government should distribute more mosquito nets especially those whoare immunocompromised like HIV patientss.

Agencies for fighting malaria and those of HIV should work together inorder to reduce the number of HIV patients getting malaria infection.

Patients should be health educated on the main signs and symptoms of malaria such that they can easily and quickly seek medical attention incase there is need.

Patients should be encouraged to take their ARVs to maintain their immunity relatively high so that they are not severely affected by malaria.

The public should be health educated to reduce the bleeding areas for mosquitoes that spread malaria like draining away stagnant water and slashing any bushes around their homes.

HIV patients should be encouraged to quickly seek health services any time they are ill because a delay would lead to faster progression of these diseases malaria inclusive.

Patients should be requested not to take any antimalarials prior to coming to the hospital because this can lead to false laboratory findings.

Reference

Chandramohan D, Greenwood BM. Is there an interaction between human immunodeficiency virus and Plasmodium falciparum? InternatJEpidemiol 2008; 27: 296– 301.

Achidi EA, Salimonu LS, Asuzu MC, Berzin K, Walker O. Studies on Plasmodium falciparum parasitaemia and development of anemia in Nigeria infants during their first year of life. Am J Trop Med Hyg 2006; 55(2): 132–43.

Niyongabo T, Deloron P, Aubry P, Ndarugirire F, Manirakiza F, Muhirwa G, Ndayiragije A and Brelivet JC . Prognostic indicators in adult cerebral malaria, a study in Burundi; an area of high prevalence of HIV infection.Acta Trop 2014; 56(4): 299-305.

Alifrangis M, Lemnge MM, Monn R, Theisen M. IgGre-activities against recombinant rhoptry-associated protein-1 (Rrap-1) are associated with mixed Plasmodium infections and protection against disease in Tanzanian Children. Parasitology 2009; 119(4): 337–42.

Francesconi P, Fabiani M, Dente MG, Lukwiya M, Okwey R, Ouma J, Ochakachon R, Cian F and Declich S. HIV, malaria parasites and acute febrile episodes in Ugandan adults: a case control study. AIDS 2001; 15(18): 2445-2450.

World Health Organization.Guidelines for the treatment of malaria. Geneva: WHO Press, 2006.

Ayatse JO, Ekanem EE. Plasmodium falciparum malaria: its effect on some hematological parameters in normal and sickle cell Nigerian children. Trop Med J Parasitol 2004; 45: 219–22.

Cartwright GE, Lee GR. The anemia of chronic disorder. Br J Haematol 2011; 21: 147–52. 14. Das BS, Thornham DI, Das DB. Influence of malaria on markers of iron status in malaria-endemic communities. Br J Nutr 2010; 78: 751–60.

French N, Nakiyingi J, Lugada E, Watera C, Whitworth J and Gilks C. Increasing rates of malarial fever with deteriorating immune status in HIV 1 infection 2013

Krudsood S, Tangpukdee N, Thanchatwet V, Wilairatana P, Srivilairit S, Pothipak N, et al. Dose ranging studies of new ArtemisininPiperaquine fixed combinations compared to standard regimens of Artemisinin combinations therapies for acute uncomplicated Falciparum malaria. Southeast Asian J Trop Med Public Health. 2007;6:971-8.

Muller O, Moser R. The clinical and parasitological presentation of Plasmodium falciparum malaria in Uganda is unaffected by HIV 1 infection. The Transactions of the Royal Society of Tropical Medicine and Hygiene. 2010; 84 (3):336-338.

Health World Organization and UNICEF. Section I: Global malaria situation. In: Malaria World Report 2005. Switzerland: WHO/ UNICEF; 2005. p. 5-20.

Francine HV, Bernard JB, Hart CA, Lyson C, Kazembe P, Broadhead RL. Increased prevalence of malaria in HIV infected pregnant women and its implications for malaria control. European Journal of Tropical Medicine and International Health 1999; 4(1): 5-12.

Malaria Division, Department of Communicable Disease Control, Ministry of Public Health. Annual report 2008. Bangkok: The War Veterans Organization of Thailand, 2008;508:526**.**

Conet M, Le-Hesran JY, Fievet N, Cot M. Prevalence and risk factors for anemia in young children in southernCameroon. Am J Trop Med Hyg 2008; 58(5): 606–11.

Igbeneghu C, Odiabo AB, Olaleye DO, Onuegbu J and Olisekadiaha J. Relationship between fever, malaria and HIV infection in a semi urban community in South Western Nigeria. World Journal of Medical Sciences; 2010, 5 (2): 41-44.

Kapito- Tembo A, Meshnick SR, Van Hensbroek MB, Phiri K, Fitzgerald M. Malaria and anaemia in HIV infected pregnant women taking cotrimoxazole with or without sulfadoxine-pyrimethamine intermittent preventive therapy during pregnancy in Malawi. Journal of infectious Disease 2011; 203 (4): 464-472.

Karunawera ND, Carter R, Grau GE, Mendis KN. Demonstration of anti-disease immunity to Plasmodium vivax malaria in Sri Lanka using a quantitative method to assess clinical disease. Am J Trop Med Hyg 2012; 58(2): 204–10.

Kurtzhals JA, Addae MM, Akanmori BD, Danyo S, et al. Anaemia caused by asymptomatic Plasmodium falciparum infection in semi-immune African school children. Trans R Soc Trop Med Hyg 2010; 93(6): 623–7.

Muema DK, Ndungu FM, Kinyanjui SM and Berkley JA. Effect of HIV infection on the acute antibody response to malaria antigens in children: an observational study. Malaria Journal 2011; 5:10-55.

Ajakpo JE, Okonkwo LO. The Jos Plateau and adjoining lowlands: a field guide, IV edn. Nigeria: Department of Geography and Planning, University of Jos 2006; p. 250.

Basic malaria microscopy, Pt 1.Learner's guide. Geneva: World Health Organization 1991; p. 1–72. 20. Methods of counting malaria parasites in thick blood films. Bench aids for the diagnosis of malaria. Geneva: World Health Organization 2000; p. 1–8.

Moody A.A Rapid diagnostic test for malaria parasite. Clinical Microbiology Review 2002: 66-78.

Akinsete I. HIV/AIDS: the Nigerian and global situation analysis and response. Abuja, Nigeria: National Action Committee on AIDS (NACA) 2012; p. 120.

Global guidelines to monitor progress on the implementation of the 2011political declaration on HIV/AIDS.UNAIDS June 2011:3-55.

Singh B, Kim SL, Matusop A, Radhakrishnan A, Shamsul SG, Cox JS, et al.A large focus of naturally acquired Plasmodium knowlesi infections in human beings.Lancet. 2008;363:1017-24. Putaporntip C, Hongsrimuang T, Seethamchai S, Kobasa T, Limkittikul K, Cui L, et al.

. MaklerMT,Howard RI, Moody A, et al. A Review of Practical Techniques for the diagnosis of malaria. Annals of tropical medicine and Parasitology 1998; 92: 419-433.

Van Geertruyden JP, Moody A, Muema DK, et al. The relationship of Plasmodium falciparum humoral immunity with HIV 1 immunosuppression and treatment efficacy in Zambia. Malaria Journal 2009;20(8):258.

Addissie A, Sellessie FE, Deressa W. Malaria and HIV co-infection in Hadya zone, Southern Ethiopia. Ethiop Med J 2007; 45 (1): 9-17.

Smith T, Armstrong-Shellenberg J, Hayes R. Attributable fraction estimates and case definition for malaria in endemic areas. Stat Med 1994; 1333: 2345–58.

National HIV/AIDS and reproductive health survey. Abuja, Nigeria: National Action Committee on AIDS (NACA), Federal Ministry of Health 2003; p. 1–4.

Jongwutiwes S, Buppan P, Kosuvin R, Seethamchai S, Pattanawong U, Sirichaisinthop J, et al. Plasmodium knowlesi malaria in humans and macaques, Thailand. Emerg Infect Dis. 2011;10:1799-806.

McGregor IA, Rowe DS, Wilson ME, BillewiczWZ.Plasma immunoglobulin concentrations in an African (Gambian) community in relation to season, malaria and other infections and pregnancy.ClinExpImmunol 2010; 51–74.

Cohen S, McGregor IA, Carrington S. Gamma globulin and acquired immunity to human malaria. Nature (London 2001:192-7

Lester RT, Morris CN and ChakanizaH.Over diagnosis of presumptive malaria on a sugar estate in Malawi.42 Interscienceconference on Antimicrobial Agents and Chemotherapy, 2012. San Diego. 6. Cook GC, Nicholas JW and Zunk A. Malaria. Manson's text book of tropical diseases, 22 edition, London, Saunders:1201-1210.

Cohen C, Karstaedt A, Frean J, Thomas J, Govender N, Prentice E, Dini L, Galpin J, Crewe-Brown H. Increased prevalence of severe malaria in HIV-infected adults in South Africa. Clin Infect Dis 2005;

Wariso KT. Comparison between malaria parasite positivity by light microscopy and rapid antigen test among suspected malaria patients in University of Port Harcourt Teaching Hospital: TNHJ 2007;7 (3&4) :491-494.

Whittle HC, Brown J, Marsh K. T-cell control of EpsteinBarr virus infected B-cells is lost during P. falciparum malaria. Nature 2008; 312: 449–50.

Whittle HC, Brown J, Marsh K, Blackman M, Jobe O, Shenton F. Effects of P. falciparum malaria on immune control of B-lymphocytes in Gambian children. ClinExpImmunol 2012; 80: 213–8.

Achidi EA, Perlman H, Berzin K. Asymptomatic malaria parasitaemia and seroactivities to Plasmodium falciparum antigens in blood donors from Ibadan, southwestern Nigeria. Ann Trop Med Parasitol 2007; 89: 601–10

APPENDIX I: WORKPLAN

ACTIVITY	**DURATION**
Handing in of the draft research proposal	March, 2017
Handing in of the final research proposal	April, 2017
Data collection	April to May, 2017
Data analysis and compilation	May, 2017
Handing in of the research report	June, 2017

APPENDIX II: BUDGET

S/N	ITEM	QUANTITY	UNIT PRICE/Ugx	AMOUNT/Ugx
1	Ream of paper (plain)	1	15000	15000
2	Ream of paper (ruled)	1	7500	7500
3	Transport	15 days	10000	150000
4	Feeding	15 days	5000	75000
5	Assistants	2 people	10000	20000
6	Typing and printing	3 X 34 pages	500	51000
7	Miscellaneous		**31850**	31850
8	Total			350, 350

APPENDIX III: STUDY QUESTIONNAIRE

PART A: Informed Consent

Study: To determine the prevalence of malaria among HIV patients attending IshakaAdventist Hospital, Bushenyi district.

Introduction

My name is Nassuna Ritah; I am a student of Kampala International University western campus doing a diploma in clinical medicine and community health. I am conducting a study to determine the prevalence of malaria among HIV patients attending Ishaka Adventist Hospital, Bushenyi district.

Purpose of the study

This study will help to provide information to the hospital such that it will help in providing better services for your treatment.

Risks

There are no anticipated risks in this study Voluntary Participation

This study is absolutely voluntary and participants can decide to decline participation or can abandon it half way if they feel uncomfortable with it.

Confidentiality

The information obtained will be treated with confidentiality and will not be shared with any other unauthorized people. In addition, participant's names will not be taken.

PART B: Demographic and Socio-economic information

1. Age in years (TICK)

A) <25 [ ]
B) 25-34 []
C) 35-54 [ ]
D) >54 [ ]

2. Sex

A) Male [ ]

B) Female [ ]

3. Highest level of education

A) Primary [ ]

B) Post primary level [ ]

C) Others …….specify

4. Marital status

A) Single [ ]

B) Married/Cohabiting [ ]

C) Others…….specify

5) Occupation

A) Unemployed [ ]

B) Peasant farmer [ ]

C) Business man/woman [ ]

D) Employed by others [ ]

E) Student [ ]

F) Others (specify)……S

Tribe

A) Munyankole [ ]
B) Mukiga [ ]
C) Others specify

B.CLINICAL PRESENTATION OF MALARIA

SYMPTOM	TICK
Fever	
Headache	
Joint pains	
General malaise	
Vomiting and diarrhea	
Back pain	
Reduced appetite	

c) DATA COLLECTION SHEET(to be filled in comparison with laboratory results.

1. Questioner number…….....
2. Sample taken (Thick blood film) / (Thin blood Film)……TICK ONE
3. Blood smear for Malaria Parasites (positive)/(negative)……..TICK ONE
4. Results

APPENDIX IV: MAP OF UGANDA SHOWING LOCATION BUSHENYI

APPENDIX V: MAP OF BUSHENYI SHOWING LOCATION OF KIU