PREVALENCE OF HIV AND MALARIA IN PREGNANT WOMEN ATTENDING ANTENATAL IN NNEWI NORTH, ANAMBRA STATE.

BY

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CERTIFICATION

This is to certify that this thesis on Prevalence of HIV and Malaria in Pregnant women Attending Antenatal in Nnewi North LGA, Anambra State,Nigeria was conducted by UNAEZE BRIGHT CHUKWUEBUKA(200856564409) of the Department of Public Health Technology under the supervision of Dr.C.O EMEROLE and has been read and approved as meeting the requirements for the award of Master Degree in Public Health.

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DECLARATION

I hereby declare that, this thesis was carried out by me and that it is a genuine record of my work.

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DEDICATION

I strongly dedicate this research project to all academicians and above all, to the Almighty God.

ACKNOWLEDGEMENT

I remain entirely grateful to Almighty God who saw me through all the hard ways Of the course.

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ABSTRACT

A cross sectional study was conducted to determine the prevalence of HIV and malaria in pregnant women attending antenatal clinic in Nnewi North, Anambra State of Nigeria. About 251 pregnant women were selected from three different hospitals for the study, after consent was obtained from the women, permission were gotten from the medical directors of the non teaching hospitals and ethical committee of the teaching hospital. Standard laboratory metholds were used for the HIV and plasmodium antigen screening.Social demographic,obstetric data were obtained using structural pretested questionnaires.Result showed that 106(42.2%) were positive for malaria infection,the peak age prevalence was 15-24 years(14.7%), there was significant difference among age groups($p<0.05$).Prevalence of malaria varied significantly according to gravidae and occupation with increase on primigravida (17.9%) and semi skills (16.3%). Then 17.9% patients were positive for HIV infection. The peak age specific incidence was 25-34 years (7.17%). Pregnant women were mostly predisposed to HIV infection by occupation,non skills had 10.75% and multiple sexual partners had 40.0% of HIV positives. Conclusively,this study has shown that malaria and HIV are still prevalence among pregnant women and they exerts public health and socioeconomic burden on pregnant women in the study area.

CHAPTER ONE

1.0 BACKGROUND OF THE STUDY

1.1 INTRODUCTION

In recent times, more pregnant women have been noticed to be infected with malaria parasite and Human Immunodeficiency Virus (HIV) (Calleja *et al.*, 2002). This is more in the developing continents of Africa and South East Asia; common among pregnant women of low-socio economic status and reduced cell mediated immunity (Brabin, 1991). Malaria is a disease with major health problems that has attracted global concern; hence, it is regarded as the most important of parasitic disease in tropical region of the world (Marielle *et al.*, 2003).Malaria remains one of the most important diseases of the tropics despite several years of concerted effort towards control. A lot of times the actual statistics is not clear in so many regions due to paucity of data and this leads to neglect of the disease and the devastation. Hundreds of millions of people are affected and pregnant women are more susceptible together with little children(Brabin,1991).It is dangerous to both the mother and the foetus. The pregnant women are at greater risk of malaria and HIV infection and of symptomatic malaria disease than non pregnant adults(brabin, 1991).According to Lindsay et al pregnant women are more attractive to mosquitoes and the malaria parasite densities are also higher in them. Malaria which is caused mainly by four Plasmodium species namely P.falciparum, P.vivax, P.malariae, P.ovale,

which is, according to Arora and Arora, the most important of all the tropical diseases in terms of morbidity and mortality (Arora dr and Arora b, 2005).They opined that more than 300-500 million individuals throughout the world are infected with the disease and 1.5- 2.7 million people die of it yearly. Each year, 25-30 million women become pregnant in malaria endemic area of Africa. According to Nigeria Federal Ministry of Health (FMH), malaria is associated with 11.0% of all maternal deaths and 70.5% of morbidity in pregnancy. It accounts for up to 15% maternal anaemia, 5%-14% of low birth weight (LBW), and 30% of preventable LBW;300 million cases (90%) occur in Africa. It reported one person in Africa dies every 10seconds and pregnant women are at risk.

HIV infection in young children most commonly arises as a result of mother-to-child transmission (MTCT). It is thought that only 1.5-2% of MTCT occurs transplacentally during pregnancy. The vast majority occurs due to maternofetal transmission of blood during parturition or postnatal breast-feeding.(Soilleux EJ,2003)

The exact mechanism of mother-to-child transmission of HIV remains unknown. Transmission may occur during intrauterine life, delivery, or breastfeeding. The greatest risk factor for vertical transmission is thought to be advanced maternal disease, likely due to a high maternal HIV viral load. Unfortunately, about 30% of pregnant women are not tested for HIV during pregnancy, and another 15-20%

receive no or minimal prenatal care, thereby allowing for potential newborn transmission.

1.2 STATEMENT OF PROBLEM

i. Malaria and HIV infection may result in a range of adverse pregnancy outcomes, including delivery of premature infants, low birth weight, spontaneous abortion, and neonatal death.

ii. Malaria can cause anaemia in the pregnant women resulting in maternal death, and also the presence of parasite in the placenta.

iii. Malaria and HIV can also result to depression of the immune system.

1.3 OBJECTIVES OF THE STUDY

General objective:

i. To determine the prevalence of HIV and malaria in pregnant women attending antenatal in Nnewi North, Anambra state.

Specific objectives:

i. To determine the prevalence of HIV in pregnant women attending antenatal clinic at Nnewi Nnewi, Anambra state.

ii. To determine the prevalence of malaria in pregnant women in the target population.

iii. To identify the factors which influence the prevalence of HIV and malaria in pregnancy.

iv. To make appropriate recommendation for the promotion of reproductive health.

1.3.1 Malaria Transmission to Foetus in Pregnant Women.

The problem of malaria infection in pregnant women was initially described nearly 65 years ago (Bouyou *et al.,* 2003). Malaria is a house hold name in Nigeria; human malaria is caused by the protozoan parasite of the genus *Plasmodium.* It lives in the red blood cell and is transmitted by the female *Anopheles mosquito.* In Nigeria, like in other endemic areas, its severe and complicated effects are most common among infants and pregnant women (Smith *et al.,* 1996). Pregnancy exacerbates malaria through a non-specific hormone-dependent depression of the immune system. The protective anti-plasmodia activity is suppressed in pregnancy, which has clinical consequences with important Public Health implications on pregnant women (Smith *et al.,* 1996).

Malaria infection leads to increased morbidity and mortality and the delivery of premature infant with low birth weights due to Intrauterine Growth Restriction

(IUGR) that may have been as a result of placenta parasitisation (Stekeete *et al.*, 1996). Malaria in pregnancy is difficult to diagnose, especially in endemic countries. Often the disease is asymptomatic in mothers who are regularly exposed to malaria and do not show the characteristics symptoms that can be seen in non-pregnant persons. One of the reasons is that malaria parasites multiply in the placenta without symptoms and cause damage, if the parasites are not checked by the patient's immunity. The parasites are rarely found in the blood stream of the mother (Creeth *et al.*, 2007).

Each year, nearly 25 million pregnant women, 20% of whom are primiparous, are confronted with malaria, primarily in the Sub-Saharan Africa. Despite considerable differences in transmission, malaria has been consistently observed as a major factor in maternal anaemia and in the frequency of low birth weight newborns. This pathogenic complex, on a background of malnutrition, combined with other parasitical, bacterial and viral (HIV) endemics is a real public health problem (Rai *et al.*, 2007).

Due to the hormonal and immunological changes that it causes, pregnancy has an impact on the incidence and seriousness of malaria. In an endemic area, traditional premonition, build up in a few years, may be sharply decreased in nine months of pregnancy (Cooper *et al.*, 2002). Different biological and immunological parameters are involved: influence of cytokines (Th_2 defenses –

{premonition} more than Th_1 {initial response} defenses), use of immune-suppressive placental steroid hormones, influence of different proteins such as CGH; a fetoprotein et cetera (Khushk *et al.*, 2006).

The seriousness depends in part on the intensity of transmission; is a function of parity and concerns especially first pregnancies (primigravidas), in particular (Van *et al.*, 2003). Malaria, more serious in primiparas (immunological naivety), is combined with important iron deficiency. During subsequent pregnancies, placental defences will keep in memory the first parasite attacks, partially protecting multiparas. The increased parasitic density in blood and placenta due to this immuno-modulation is closely linked to maternal anaemia, prematurity and especially low birth weight, a real public health problem for these pregnant women (Rowland and Lohman, 2002).

1.3.2 Plasmodium Falciparum Malaria and HIV Infection in Pregnancy.

Unfortunately, the "Pregnant + HIV + *P-falciparum* malaria", tripod is becoming more and more common. In this confrontation of HIV/MALARIA, episodes of malaria are more frequent, anaemia is more severe and, for multiparas, it appears that malaria is actively involved in the increased of vertical transmission of the virus. HIV also affects pregnant women, just like malaria. The HIV epidemic, quite unlike other infections, combining the problems of a lifelong medical

disease with immense social, psychological, economic and public health consequences worldwide, the number of childbearing women infected with the HIV is rising.

Identification of HIV positive women during pregnancy provides an opportunity to reduce vertical transmission and optimize the care of HIV infected mothers and children. The effectiveness of prenatal HIV screening depends on the prevalence of HIV in a given population, and the availability of services of HIV positive pregnant women (Chandramohan and Greenwood, 1998). HIV in pregnancy has become an increasingly important focus of attention in HIV research because of its role in contributing in the spread of the infection. Risk factors significantly associated with positive HIV status were multiple sexual partners, history of at least one STI, blood transfusion, sharing of sharp objects, young age at first pregnancy and low gravidity (low parity) transplacental (MTCT) (Dabis and Ekpini, 2002).

HIV in pregnancy has become a major component of the worldwide pandemics (Calleja *et al.,* 2002).Most women who have contracted the virus are of childbearing age and transmission to their offspring is likely to be a major burden on obstetric and paediatric health services. Many women may be unaware of their HIV status until they are tested during pregnancy (Gregson *et al.*, 2002). The impact of HIV on the reproductive behaviour of these women will directly affect the spread of the disease both in terms of vertical transmission to children and

horizontally to their sexual partners through unprotected sexual intercourse (Suillivan, 2003). These women continue to desire the experience of motherhood and breast feeding while having concerns for the health of their children (Suillivan, 2003). The risk of transmission to children from mother in the pre- and perinatal periods is thought to be in the range of 20-30%. This can be reduced significantly by the use of anti-retroviral therapy during the pregnancy (Cooper *et al.*, 2002).

The prevalence of HIV infection in pregnancy has been reported to range between 10% and 15% in Ethiopia and Ghana respectively (Sentjens *et al.,* 2002). It has been suggested that after a negative test in the first trimester, retesting should be done during the third trimester of pregnancy (Sansom *et al.,* 2003). Age at first sexual experienceee has been implicated in a greater risk for HIV transmission. These results have been replicated in Zimbabwe where sexual intercourse at an early age (less than 15years) has been found to be associated with increased rates of HIV (Pettifer *et al.,* 2004). Other factors found to be associated with HIV infection among the female reproductive age population include a high level of fertility and teenage pregnancies. Other risk factor know to be associated with HIV transmission include multiple sex partners, commercial sex activity and the presence of sexually transmitted diseases (Zanis *et al.,* 1997).

1.5 SIGNIFICANCE OF THE STUDY

The prevalence of HIV and malaria is high, especially in pregnant women. This is another time a study ; HIV and Malaria in pregnant women will be carried out in Nnewi North, Anambra state. This is important because it will show the prevalence of this infection in Nnewi and will help in determining the predisposing factors to these infections in pregnant women in the locality. Also, from the study, early intervention can improve care for these women and reduce HIV and malaria load and transmission to their children. However, for intervention strategies to be effective, childbearing women at risk must be identified and interventional steps on how to prevent these infections in pregnant women can be recommended.

Based on these, a policy on screening for HIV and malaria in pregnancy, as well as treatment of these infections can be developed.

CHAPTER TWO

2.1 LITERATURE REVIEW

Plasmodium falciparum infection during pregnancy is estimated to cause an estimated 75,000 to 200,000 infant deaths each year (Steketee *et al.,* 2001). In areas of epidemic or low (unstable) malaria transmission, adult woman have not acquired any significant level of immunity and usually become ill when infected with *P. Falciparum* (Steketee *et al.,* 2001). For pregnant woman in these areas, the risk of developing severe malaria is 2-3 times higher than that for non-pregnant women living in the same area. Maternal death may result either directly from severe anaemia. In addition, malaria may result in a range of adverse pregnancy outcomes, including low birth weight, spontaneous abortion, and neonatal death. In areas of high and moderate (stable) malaria transmission, most adult women have developed sufficient immunity that, even during pregnancy, *P. Falciparum* infection does not usually result in fever or other clinical symptoms (Stekeete *et al.,* 2001). In these areas, the principal impact of malaria infection is malaria-related anaemia in the mother and the presence of parasite in the placenta.

Studies from 1950s through 1984 focused on *Plasmodium falciparum* infections and described the frequency of placental infections and specific adverse consequences. Infection rates have been consistently demonstrated to be highest in women in these first and second pregnancies, with lower rates in later pregnancies (Brabin *et al.,* 1991). In a study conducted by Kayentao *et al.* (2005)

in West Africa, it was shown that the parasitaemia was detected in 40% of primiparas and 20% in multiparas, the infested placentas were found an average in 22% of pregnancies were found at a rate of 35% in primigravidas and 15% in multigravidas and lastly, the average rate of 15% of low birth weight newborns was three times higher in primiparas than in multiparas. In this same study, prematurity was 50% and 1.5% of umbilical cord blood carried the parasites (Kayentao *et al.*, 2005).

Moreso, congenital malaria is associated with primiparity, the extent of infection and sensitivity of placenta. The placenta is altered and weakened by the accumulation of parasites, their particular adhesion, and hormonal, inflammable and circulatory repercussions (Cot *et al.*, 2003). The transmission of parasites from mother to foetus (close to 10% of women infected with parasites) causes congenital malaria summed up to a healthy carrying of parasites by the newborn. Congenital malaria as a disease is rare (<1%) and has limited consequences. The mother's IgG, passed through the placenta, protect the child from clinical episodes for the first six months of life. Cord parasitaemia (congenital malaria infestation, 20% of cases, is 300 to 100 times lower than in the mother) bears no relation to the low frequency (0.5%) of congenital malaria disease (Adefioye *et al.*, 2007). Delivery may be disrupted by a mechanical (splenomegaly) on dynamic (uterine hypoxia) dystonia (Cot *et al.*, 2003).

2.2 Malaria in Nigeria and Other Developing Countries.

The recent world report, which indicated that Nigeria accounts for a quarter of all cases in the 45 malaria-endemic countries malaria in Africa, clearly showed that challenge of malaria in Nigeria (WHO, 2008). This may be due to the large population, approximately 140 million people living in areas of high malaria transmission. In Nigeria, 11% of maternal deaths are attributed to malaria. To further buttress the worrisome malaria picture, many researchers have reported high prevalence rates of malaria in pregnancy in different parts of Nigeria, ranging from 19.7% to 72.0% (Adefioye *et al.*, 2007).

Thus, pregnant women, who are known to be one of the groups at high risk of the effects of malaria infection, need special protective measures to ensure their survival and improve birth outcomes. However, these reports create the impression that the efforts to control malaria by the government and other agencies like Roll Back Malaria Programme, WHO, UNICEF, and many other non-governmental agencies might not be effective; there are reports of up to 50% reduction, especially with regards to malaria in pregnancy (WHO, 2008). A report also showed that the age group of <24years was reported to be at a high risk. To stem this trend, awareness on malaria prevention measures during pregnancies should target young women even before they get married (Bouyou-akotet *et al.*, 2003). Another report also showed that malaria prevalence decreased with increasing age but increased in age group >34years.

Marielle et al. (2003), reported a high prevalence of malaria in pregnant women within a similar age group (36-39years) in Gabon. With treatments and delivery options, 99% of HIV-infected women will have uninfected babies. However, without treatment 1 in 4 babies will become infected.

2.3 POSITIVE TEST ON ELISA

A study done in Pakistan between March 2007-May 2008 showed that out of 5263 antenatal bookings 785 (14%) women were identified with a risk factor. HIV screening test was done in 779 (99%) women and 6 women refused testing. Three (3) women (0.3%) were found positive (reactive) on screening. Two (2) out of three (3) women were confirmed positive (0.2%) on ELISA. Husbands of both women were tested and one found positive (migrants from Dubai), second woman had history of blood transfusion; her husband was HIV positive through ANC risk screening. Six (6) confirmed HIV positive women were found pregnant and spouses of 5 out of the 6 women had history of working abroad and extra marital sexual relationships (Ghazala *et al.*, 2009).

A previous study in North Trinidad by Hutchinson et al. (2006), shows that out of a total of 534 pregnant women who participated in the study, 37 (6.84%) were HIV positive. The highest prevalence of HIV infection was found among women between the ages of 24 and 28years and there were 14 positive cases out of 132

(10.60%) women in the 29-33year age group. There were no positive cases in the 14-18year and over 39year age groups.

2.4 Higher Parasite Density With increased frequency of clinical Malaria among Hiv infected individuals.

Women with HIV and malaria co-infection are at particular risk of severe adverse outcomes of pregnancy because of the possible interactions between the two infections. In a study population, HIV infected women were more likely to present with malaria during pregnancy, a finding consistent with that of other studies showing higher parasite density and increased frequency of clinical malaria among HIV infected individuals as well as among pregnant women (Ladner *et al.,* 2003). It is possible that HIV infection impairs the immune response to P. Falciparum. On the other hand, malaria infection in HIV positive pregnant women increases the risk of mother to child transmission of HIV (Ladner *et al.*, 2003).

Clinical trial in Kenya, reported that presumptive treatment of all pregnant women in malaria endemic area with only two doses of Sulfadoxine-Pyrimethamine will reduce the incidence of anaemia among first time mothers by 39%. Another study observed a reduction in the incidence of low birth weight babies from 14% when only symptomatic mothers were treated presumptively.

Treatment of all mothers at risk of malaria with Sulfadoxine-Pyrimethamine is now the Standard of Care in clinical settings in Kenya and elsewhere (Sterkete and Studman, 1999).

A retrospective analysis of children born in a Malawi trial of prenatal chemoprophylaxis reported a sharply increased risk of postnatal mortality when mothers have placental malaria, HIV, or both. A normal birth weight baby born to an HIV-infected woman with placental malaria was 2.7 times more likely to die than the child of an HIV-infected woman without placental malaria. This same child was 4.5 times likely to die than one born to an HIV negative woman who had placental malaria. The risk of postnatal death increased to nearly 8 times if the infant had a low birth weight (Bioland *et al.*, 1995).

2.5 DOES MALARIA TREATMENT AFFECT HIV?

A question was raised, whether malaria treatment affects HIV, possible answer to this question were elicited by a study in Malawi that reported a lowering of plasma HIV levels during Sulfadoxine-Pyrimethamine treatment of acute falciparum malaria. At baseline, 47 positive men and women with confirmed symptomatic falciparum malaria had a median viral load of 151,000 copies/ml. The baseline median viral load of the control group, consisting of 42 asymptomatic, a parasitic HIV-positive men and women, was 22,000 copies/ml. Twenty-seven (27) malaria subjects and 22 non-malaria subjects completed 4

weeks of follow-up. After 4weeks on treatment, the median viral load of the 27 malaria patients had declined from 191,000 copies/ml. Then, the median viral load of the control group increased slightly (Kieffer *et al.*, 2010). A different anti-malarial agent is Chloroquine; a drug with immune modulatory qualities that has also been reported to have an inhibitory effect on HIV *in vitro* (Kinuthia *et al.*, 2010). Although, conducted before the availability of sensitive viral load assays, a clinical trial that composed Chloroquine to ACT in asymptomatic patients reported equivalent reductions in recoverable HIV after 16weeks (Kinuthia *et al.*, 2010).

A study in Uganda reported no difference between the incidence (but not the severity) of malaria episodes in children with or without HIV. The authors wondered whether the anti-HIV properties of the Chloroquine administered to both groups had confounded their observations as HIV integrase inhibitors (Brabin, 1991). Drug resistant strains of malaria are threatening to cripple efforts to arrest the epidemic. Chloroquine resistant *Plasmodium* is widespread in many parts of Southeast Asia and increasingly common in Africa. Resistance to Sulfadoxine-Pyrimethamine has been noted in Tanzania and elsewhere. Chloroquine Sulfadoxine-Pyrimethamine, as first and second line treatments, once offered a cure for about twenty cents per person. The drugs needed to treat resistant strains of malaria cost many times the amount and will not be widely available in poor countries. As with Tuberculosis and HIV, the solution to effective treatment of this resistance prone pathogen may lie in adopting

combination therapy with agents that block the Plasmodium life cycle at two crucial points instead of one, therapy multiplying protection against resistance (Bruce, 1987). Although expensive HIV drugs are not likely to become available soon for everyday treatment in malarial regions, the efficacy of low cost, short course anti-retroviral therapy to prevent mother-to-child transmission during birth has been established. The use of ACT and Nevirapine in pregnancy is growing and could soon become standard of care throughout most of the world. Although, pregnant women in endemic malaria regions are routinely prescribed prophylaxis for malaria, no studies have been made of the potential for pharmacologic, toxic and teratologic interactions between these various classes of drugs (Ladner *et al.*, 2003).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 STUDY AREA:

The study was carried out in Nnewi North, Anambra state between the month of May and August, 2012. Nnewi town is situated in Anambra state, Nigeria with total population of about 391227 people with 201,824 males and 189,403 females. The city spans an area of over 1,076.9 square miles (2789 km).The main occupation of inhabitants are farming and trading (automobile and motocycle spare parts). There are about 11 wards in four villages that make up the Nnewi North LGA. Nnamdi Azikiwe University Teaching Hospital, Life specialist Hospital, Chiderah Hospital and maternity are located in Nnewi North.

3.2 STUDY DESIGN

This is a cross sectional descriptive study to investigate the prevalence of HIV and malaria in pregnant women attending antenatal clinic in three different hospitals in Nnewi North, Anambra State was adopted. The hospitals includes,

1. Nnamdi Azikiwe university Teaching Hospital,Nnewi.

2. Life specialist Hospital and

3. Chiderah Hospital and maternity,Nnewi.

3.3 STUDY POPULATION

The study population were pregnant women, who were enrolled into antenatal care services in three different hospitals in Nnewi North, Anambra state.The hospitals includes,

1.Nnamdi Azikiwe university Teaching Hospital, Nnewi.

2.Life specialist Hospital, and

3.Chiderah Hospital and maternity,Nnewi.

3.4 SAMPLE SIZE DETERMINATION

The minimum sample size for this study was determined using the statistical formular by Yaro (Yr):

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = Sample size

N = Total number of pregnant women attending antenatal clinic.

e = Degree of accuracy desired which is set at 0.05 level.

Sample size $\mathbf{n} = \dfrac{\mathbf{N}}{\mathbf{1 + N (e)^2}}$

$$\mathbf{n} = \frac{251}{1 + 251\ (0.05)^2}$$

$$\mathbf{n} = \frac{251}{1 + 251\ (0.0025)}$$

$$\mathbf{n} = \frac{251}{1 + 0.6275}$$

$$\mathbf{n} = \frac{251}{1.6275}$$

$$\mathbf{n} = 157.224$$

$$\mathbf{n} = \underline{\underline{157}}$$

3.5 DATA COLLECTION

The study was carried out between the month of May and August, 2012 a predominantly rainy season in Nigeria.The participants gave informed consent while rermission from the medical Directors of concerned non teaching hospitals and NAUTH ethical committee approved the study design. All the pregnant women that enrolled in the hospitals for antenatal care during the period of this research were suspected of HIV, or malaria or both infections and were screened for both infections using their blood samples. A rapid staining protocol using 30% Giemsa stain for thick smear for 15 minutes and rapid malaria kit and HIV antibody by using determine rapid HIV test kits and first response. After the screening, a semi- structural questionnaire was administered to those who tested positive to HIV, or malaria or both infection to determine the prevalence and risk factors of HIV and malaria in pregnancy.And the questionnaires were designed under three sections (see appendix 1).

3.6 DATA ANALYSIS

A rapid staining protocol using 30% Giemsa stain for thick smear for 15 mins and rapid malaria kit were used for malaria identification, and HIV antibody by using determine rapid HIV test kits and first response HIV 1 and 2 were used. A total of 280 questionnaires were distributed, 259 were returned, 8 were found to contain incomplete data and therefore discarded, while 251 were analysed.

Data collected were analysed using statistical package for social sciences (spss) for windows. Descriptive statistics were carried out. Statistical significance was considered at $p<0.05$ level.

3.7 CONSENT

Consent were gotten from the ethical committee of Nnamdi Azikiwe university teaching hospital and permission from medical directors of non teaching hospitals and verbally from the patients.

3.8 INCLUSION CRITERIA

All the pregnant women that came for antenatal for the first time and whose pregnancy was between 20-24 weeks were selected using a stratified-random sampling.

3.9 EXCLUSION CRITERIA

1. History of or active presence of a major or life threatening opportunistic infection.

2. Active substance abuse which might prevent compliance with the studys requirements.

3. Non residents in the study area.

4. Those that are not willing to comply with the study requirements.

CHAPTER 4

4.0 RESULT

The data analysis results are presented below according to the variables.

Table 1

Prevalence of HIV Positivity and Negativity in different Hospitals.

HOSPITALS	Positive for HIV.n(%)	Negative for HIV.n(%)	TOTAL
Nauth	**30(12.0)**	**87(34.7)**	**117(46.6)**
Life specialist hospital	**9(3.6)**	**68(27.1)**	**77(30.7)**
Chiderah Hospital	**6(2.4)**	**51(20.3)**	**57(22.7)**
	45(17.9)	**206(82.1)**	**251(100)**

Table 1, shows the prevalence of HIV in different hospitals. Out of the 45 positive samples NAUTH had the highest prevalence 30 (12.0%).

Table 2

Prevalence of Malaria Parasite Positivity in different Hospitals.

HOSPITALS	Positive for Malaria.n(%)	Negative for Malaria.n(%)	TOTAL
Nauth	**43(17.1)**	**70(27.9)**	**113(45.0)**
Life specialist Hospital	**32(12.7)**	**40(16.0)**	**72(28.7)**
Chiderah Hospital	**31(12.4)**	**35(13.9)**	**66(26.3)**
	106(42.2)	**145(57.8)**	**251(100)**

Table 2, shows the prevalence of malaria parasite in different hospitals. Out of the 106 positive samples, NAUTH had the highest prevalence of 43 (17.1%).

Malaria is equally distributed among the three hospitals studied.

Table 3

Prevalence of HIV-positivity by age.

AGES (years)	POSITIVE n (%)	NEGATIVE n (%)	TOTAL
15-24	12 (4.8)	60 (23.9)	72(28.7)
25-34	18 (7.17)	77 (30.7)	95(37.8)
35-44	15 (6.0)	69 (27.5)	84(33.4)
TOTAL	45(17.9)	206(82.1)	251(100)

Table 3, shows the prevalence of HIV positive by age, from the table, age group of 25-34 had the highest prevalence 18 (7.17%).

HIV infection is equally distributed among the three age groups studied ($p > 0.05$).

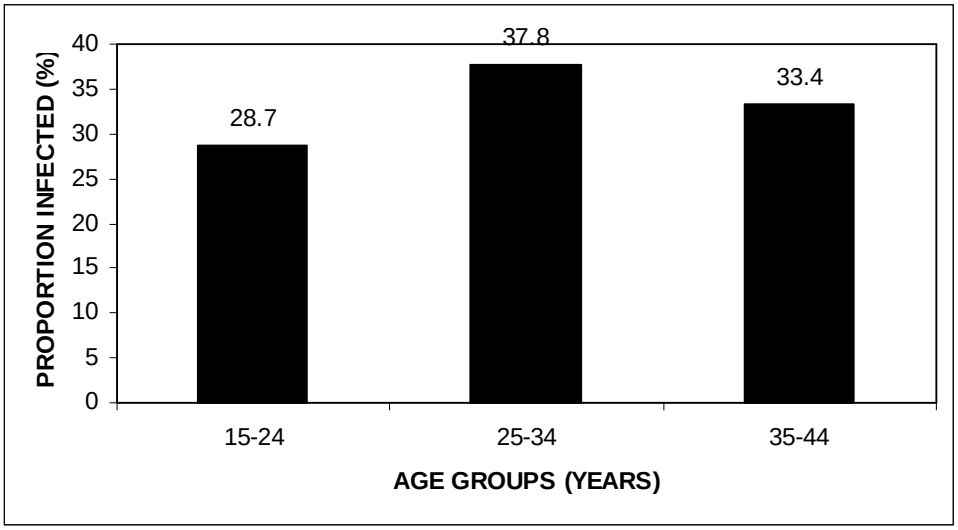

Figure 1

Comparism of HIV and proportion of infected pregnant women by age group.

Table 4

Prevalence of Malaria parasite-positivity by age.

AGES (years)	**POSITIVE n (%)**	**NEGATIVE n (%)**	**TOTAL**
15-24	37 (14.7)	52 (20.7)	89(35.5)
25-34	34 (13.5)	45 (17.9)	79(31.4)
35-44	35 (13.9)	48 (19.1)	83(33.1)
TOTAL	106(42.2)	145(57.8)	251(100)

Table 4, shows the prevalence of malaria positive by age, from the table, age group of 15-24 had the highest prevalence 37 (14.7%).

1. There is a significant difference between malaria parasite positive and malaria parasite negative proportions ($p < 0.05$).

2. Malaria parasite positive subjects are equally distributed among the three age groups studied ($p > 0.05$).

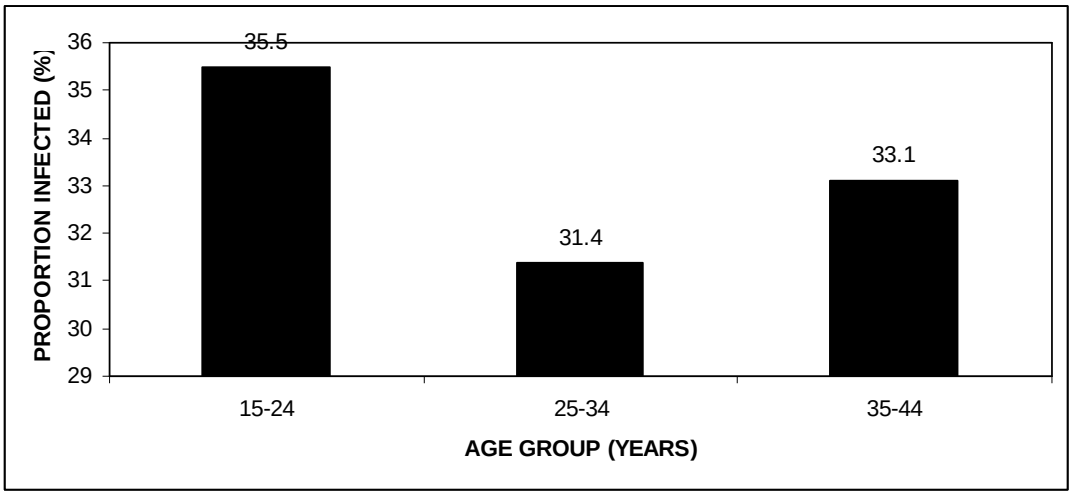

Figure 2

Comparism of malaria parasitaemia and proportion of infected pregnant women by age group

Table 5

Prevalence of HIV-positivity by occupation.

OCCUPATION	**POSITIVE n (%)**	**NEGATIVE n (%)**	**TOTAL**
Skill & professionals	5 (1.99)	49 (19.5)	54(21.5)
Non skills	27 (10.75)	85 (33.9)	112(44.6)
Semi skills	13 (5.18)	72 (28.7)	85(33.9)
TOTAL	45(17.9)	206(82.1)	251(100)

Table 5 shows the prevalence of HIV positive by occupation, Out of the 45 (17.9%) positive to HIV, Non skills eg House wife had the highest prevalence of 27 (10.7%).

HIV positive is more in non skilled group than the skilled and semi skilled groups ($p<005$).

HIV positive is equally distributed between skilled and semi skilled groups ($p> 0.05$).

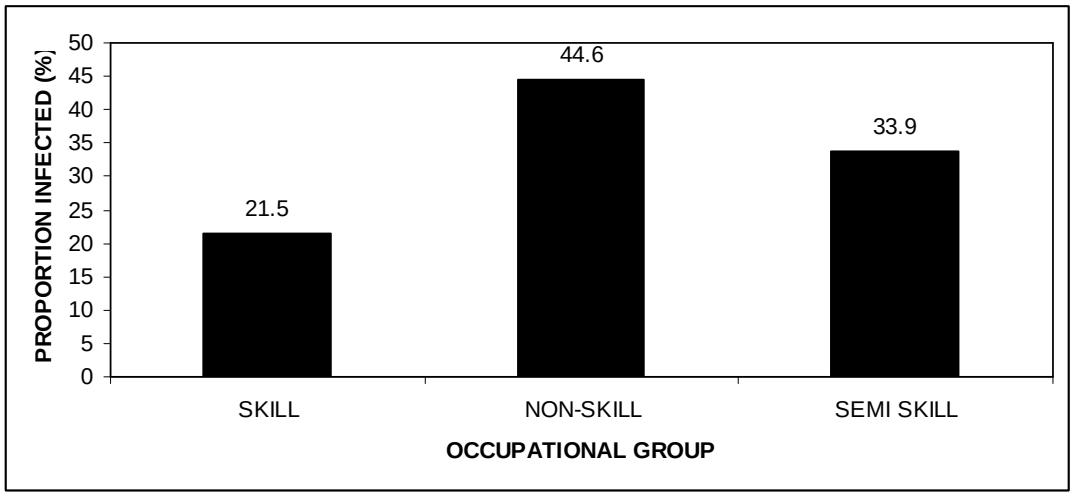

Figure 3

Comparism of HIV and proportion of infected pregnant women by occupation

Table 6

Prevalence of Malaria parasite-positivity by occupation.

OCCUPATION	**POSITIVE n (%)**	**NEGATIVE n (%)**	**TOTAL**
Skill & professionals	31 (12.4)	46 (18.3)	77(30.7)
Non skills	34 (13.5)	51 (20.3)	85(33.8)
Semi skills	41 (16.3)	48 (19.1)	89(35.5)
TOTAL	106(42.2)	145(57.8)	251(100)

Table 6 shows the prevalence of malaria parasite by occupation, Out of the 106 (42.7%) positive, semi skills had the highest prevalence 41(16.3%).

It shows that malaria parasite positive is equally distributed among the three groups evaluated**.**

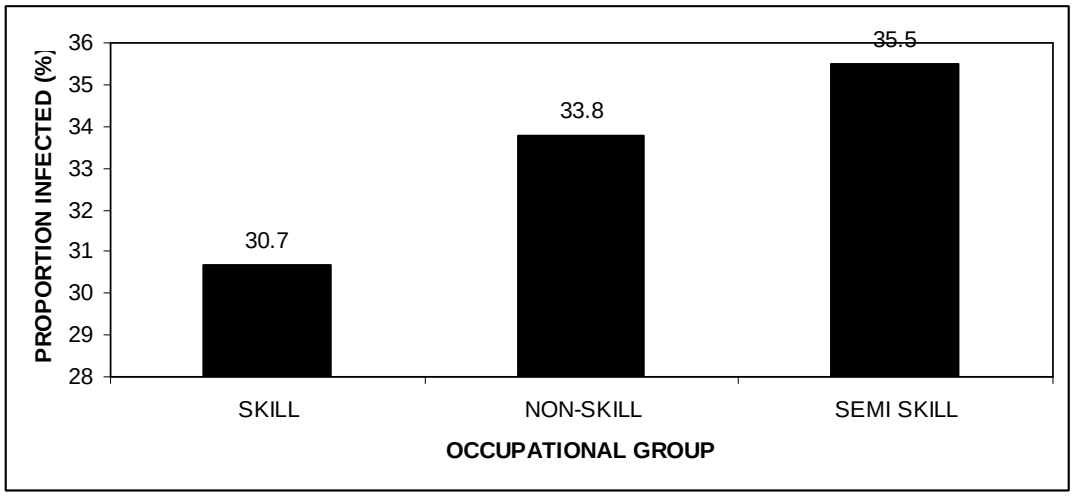

Figure 4

Comparism of malaria parasitaemia and proportion of infected pregnant women by occupation.

Table 7

Prevalence of HIV-positivity (45) women by determinant factors.

FACTORS INFLUENCES HIV	**FREQUENCY**	**PERCENTAGE (%)**
History of blood transfusion	11	24.4
Multiple sexual partner	18	40.0
History of dental removal	3	6.7
History of sharp object	7	15.6
Women that do not live with their husbands	6	13.3
TOTAL	45	100

Table 7, shows the prevalence of HIV positive women by determinant factors, out of the 45 positive women, multiple sexual partners had the highest prevalence 18 (40.0%).

Table 8

Prevalence of Malaria parasite by use of ITNs

USE OF INSECTICIDE TREATED NET	**FREQUENCY**	**PERCENTAGE (%)**
Number that use treated mosquito net	46	43.4
Number that do not use treated mosquito net	60	56.6
TOTAL	106	100

Table 8 shows the prevalence of malaria parasite positive by use of insecticide treated net. Out of the 106 positive women, 46 (43.4%) uses treated mosquito net.

Table 9

Prevalence of Malaria parasite-positivity by number of pregnancies.

NO OF PREGNANCIES	Positive n(%)	Negative n(%)	TOTAL
Primigravida	45(17.9)	42(16.7)	87(34.7)
Secongravida	30(11.9)	47(18.7)	77(30.7)
Multigravida	22(8.8)	29(11.6)	51(20.3)
Grand multigravida	9(3.6)	27(10.8)	36(14.3)
TOTAL	106(42.2)	145(57.8)	251(100)

Table 9 shows the prevalence of malaria parasite positive by number of pregnancies, out of the 106 positive, 45 (17.9%) were primigravida with the highest prevalence.

It shows that in malaria there is significant differences between primigravida and multigravida, grand multigravida.

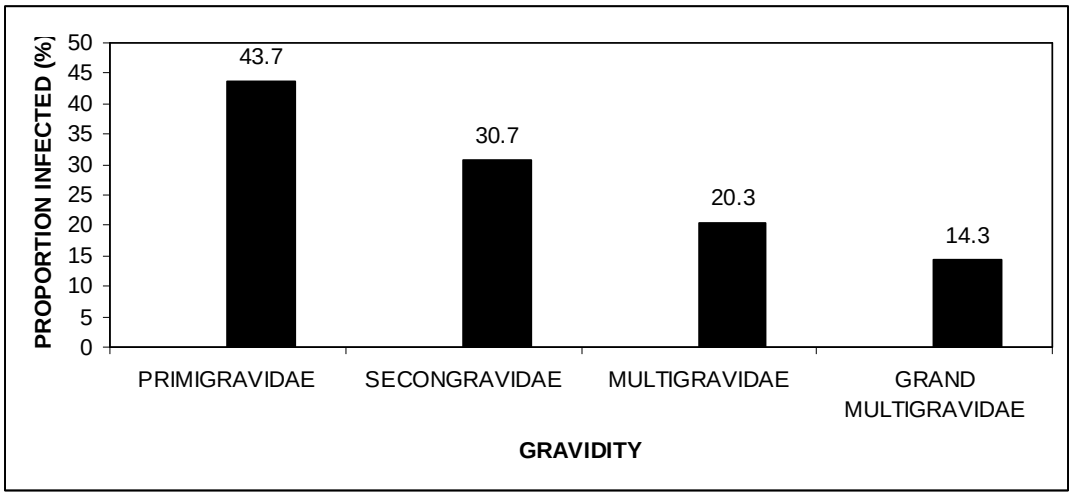

Figure 5

Comparism of malaria parasitaemia and proportion of infected pregnant women by gravidity

Table 10

Prevalence of HIV by number of pregnancies.

NO OF PREGNANCIES	POSITIVE n (%)	NEGATIVE n (%)	TOTAL
Primigravida	19 (7.6)	53 (21.1)	72(28.7)
Secongravida	13 (5.2)	58 (23.1)	71(28.1)
Multigravida	11 (4.3)	55 (21.9)	66(26.3)
Grand multigravida	2 (0.8)	40 (15.9)	42(16.7)
TOTAL	**45(17.9)**	**206(82.1)**	**251(100)**

Table 10 shows the prevalence of HIV positive by number of pregnancies, out of the 45 positive women, primigravida had the highest prevalence 19 (7.6%).

It shows that there is a significant difference between primigravida and secongravida, multigravida.

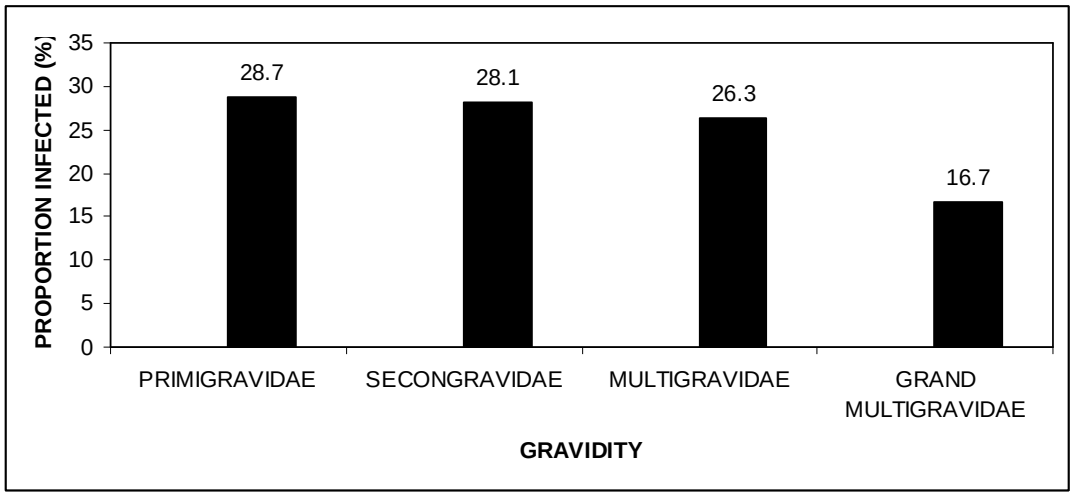

Figure 6

Comparism of HIV and proportion of infected pregnant women by gravidity

CHAPTER FIVE

5.1 DISCUSSION

The prevalence of malaria and HIV reckoned among pregnant woman in this study is traceable to the terrain of the study area, their social activities and environmental factors which serves as potential habitat for the breeding of mosquitoes. Also poor environmental conditions occasioned by lack of effective sanitary practices favoured constant presence and transmission of malaria.

The prevalence of HIV infection among the female reproductive age population are associated with some risk factors like history of blood transfusion, multiple sex partners and the presence of sexually transmitted diseases by zanis et al,1997. Lucus and Gilles had already observed four factors that determined the epidemiology of malaria in pregnancy: Environmental, Vectorial, parasite and host factors. The significant difference in the prevalence of malaria between the different locations of residence can be likened to the disparities in the level of environmental sanitation, and HIV which can be affected by the socioeconomic status of the pregnant women.

From the result, out of 251 patients screened 45 (17.9%) were positive for HIV and age group of 25-34 recorded the highest prevalence, while 106 (42.2%)were positive for malaria parasite and age group of 15-24 recorded the highest prevalence. Study is in accordance with previous report by Pettifer et al, 2005 that age may be an independent risk factor, as younger pregnant women have been found to be more susceptible to malaria and HIV in some settings. These findings show that age plays a dominant role in the

susceptibility of pregnant women to malaria and HIV because they are sexually active.

Many women may be Unaware of their HIV/Malaria status until they are tested during pregnancy (Gregson et al., 2002).

Pregnant women who had no or formal education or the type of occupation have find to affect their HIV and malaria prevalence. The occupational environment of these women played a role in their susceptibility to the diseases. In this study, out of the 45 HIV positive pregnant women, Non Skill e.g House wife had highest prevalence rate 27 (10.75%) and out of the 106 malaria parasite positive, Semi skills e.g Business women had the highest prevalence rate 41(16.3%) and these are in accordance with some previous work.

Use of treated mosquito net has a role to play in the control and prevention of malaria parasite infection. In this study, out of the 106 malaria parasite positive, only 46 (43.4%) uses treated mosquito net, and the present results are in line with those of previous ones. Most of the respondents agreed that the absence of mosquito net predisposed them to the disease.

Number of pregnancy otherwise known as gravidia was also observed to play a role in malaria prevalence, in this study as observed that women with one number of pregnancy (primigravidae) were more infected than women with three or more numbers of pregnancy (multigravidae and grand multigravidae), this can be as a result of immunological naivety by Van et al, 2003.

Out of 106 malaria parasite positive, primigravidae had the highest prevalence

45 (17.9%). And out of 45 HIV positive, primigravidae also had the highest prevalence 19 (7.6%).

It is expedient to conclude from the findings of this study that Malaria/HIV continues to exert significant public health and economic burden among pregnant women in parts of Nnewi North, Anambra state of Nigeria. And this will continue unless urgent and proactive steps are taken. Pregnant women should be encouraged to attend antenatal care whereas malaria and HIV screening/education should be carried out frequently. Early detection and prompt appropriate case management of pregnant women with symptoms and signs of malaria and HIV should also be improved.

5.2 CONCLUSION

This study has shown that the prevalence of HIV and malaria are still high among the pregnant women and they exerts public health and socioeconomic burden on pregnant women in the study area. And is dependent on the age, occupation, number of pregnancies, behaviour to use of treated mosquito net and different determinant factors.

5.3 RECOMMENDATIONS

The following recommendations are made in other to promote reproductive health ;

1. Malaria and HIV screening should be sustained on every pregnant women that come for antenatal to quicken their treatment.
2. Intermittent preventive therapy should be administered to pregnant women at regular scheduled ANC visit to reduce the prevalence of maternal anemia, spontaneous abortion, preterm birth, still birth, and low birth weight.
3. Antiretroviral treatment should be given intensively to HIV positive women and advice not to breastfeed to prevent mother to child transmission.
4. Health education to use of insecticide treated nets.

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APPENDIX 1

QUESTIONNAIRE FOR PREVALENCE OF HIV AND MALARIA IN PREGNANT WOMEN ATTENDING ANTENATAL IN NNEWI NORTH, ANAMBRA STATE.

Section A: Demographic Variables

1 Age

a. 15-24

b. 25-34 ☐

c. 35-44

d. 45 and above.

2 What is your occupation?

a. Professionals.

b. intermediate

c. Skilled ☐

d. Semi skilled

e. Non skilled

3 Do you live with your husband?

a. Yes

b. No ☐

4 Is this your first pregnancy?

a. Yes

b. No

5 Number of pregnancy

a. 1

b. 2

c. 3

d. 4

e. 5 and above

Section B: HIV Exposure risk

6 Any history of blood transfusion?

a. Yes

b. No

7 Any previous history of sexually transmitted infections?

a. Yes

b. No

8 Any history of multiple sexual partners?

a. Yes

b. No

9 Do you braid your hair with sharp object?

a. Yes

b. No ☐

10 Any history of surgery?

a. Yes

b. No ☐

11 Are you aware that a pregnant woman can be infected with HIV?

a. Yes

b. No ☐

12 Are you aware that there are interventions to prevent or control HIV in pregnancy as a part of antenatal care?

a. Yes

b. No ☐

Section C: Malaria Exposure risk

13 Do you sleep under mosquito net?

a. Yes

b. No ☐

14 When last did you take antimalaria drug?

a. <1 months

b. <2 months

c. <3 year

d. <6 months

e. <1 year

15 Are you aware that there are interventions to prevent or control malaria in pregnancy as a part of antenatal care?

a. Yes

b. No

16 Where do you live?

a. Rural

b. Semi urban

c. Urban