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PREVALENCE OF MALARIA AMONG HIV PATIENTS IN 44 NIGERIA ARMY REFERENCE HOSPITAL KADUNA (44 NARHK)

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ABSTRACT
Human immunodeficiency virus (HIV) is a public health problem with socio-economic burden as well as threat for development. Another disease of almost equivalent magnitude is malaria, which is ravaging almost all the tropical regions of the world, particularly the developing countries, including Nigeria. The consequence of these two deadly diseases haboured in a person is very enormous. It is in this perspective that we studied the prevalence of malaria among the HIV/AIDS patients attending the 44 Nigeria Army Reference Hospital, Kaduna with a view to highlight the severity of the condition in a military set up and consequently suggest ways of amenorating the patients' condition in order to improve their longevity. Blood samples of 250 HIV patients within the age group of 15-55 years in 44 Nigeria Army Reference Hospital Kaduna were screened for the prevalence of malaria. The subjects were made up of 85 (34%) males and 165 (66%) females. In all, 148 (59.2%) were positive for malaria. The highest prevalence of malaria (61.2%) was observed among age group 31-45 years. The low class for the social status had the highest prevalence of (77.14%), out of the three social status classes examined. The sex distribution of parasitemia revealed a higher prevalence of (73.24%) among the females. Based on the result it was recommended that patients be diagnosed routinely and treated as required for malaria. It is equally important that patients sleep under insecticide-treated nets.

KEY WORDS: Malaria, Prevalence, HIV patients, Parasitemia.

INTRODUCTION

Two of the greatest medical challenges facing Africa today are Human Immunodeficiency Virus (HIV) infection and malaria, and yet the interaction between these two infections has been little studied. Our current understanding of human immune response to malaria and HIV leads us to expect of the other. Many other types of infections have been documented to cause at least a transient increase in HIV viral load. Hence, it is logical to expect malaria to do the same; and thus to accelerate HIV disease progression (Chandramohan and Greenwood, 1998). Malaria is a mosquito-borne infectious disease of humans and other animals caused by eukaryotic protists of the genus *Plasmodium*. The disease results from the multiplication of Plasmodium parasites within red blood cells, causing symptoms that typically include fever and headache, in severe cases progressing to coma or death. It is widespread in tropical and subtropical regions, including much of Sub-Saharan Africa, Asia, and the Americas (Ukoroije and Abowei, 2012). Five species of malaria can infect and be transmitted to humans. Severe disease is largely caused by *Plasmodium falciparum* while the disease caused by *Plasmodium vivax, Plasmodium ovale* and *Plasmodium malariae* is generally a milder disease that is rarely fatal (Sutherland *et al.*, 2010). *Plasmodium knowlesi* is a zoonosis that causes malaria in macaques but can also infect humans (Singh *et al.*, 2004). Ninety percent of malaria-related deaths occur in sub-Saharan Africa, with 60% of deaths being young children under the age of five (Christopher *et al.*, 2012). *Plasmodium falciparum*, the most severe form of malaria, is responsible for the vast majority of deaths associated with the disease (Snow *et al., 2005)*. Malaria is commonly associated with poverty, and can indeed be a cause of poverty and a major hindrance to economic development. Malaria transmission can be reduced by preventing mosquito bites by distribution of mosquito nets and insect repellants, or by mosquito-control measures such as spraying insecticides and draining standing water (where mosquitoes breed). Despite a clear need, no vaccine offering a high level of protection currently exists. Efforts to develop one are ongoing. A number of medications are also available to prevent malaria in travelers to malaria-endemic countries (prophylaxis) (Kilamai and Ntoumi, 2009). Human immunodeficiency virus (HIV) is a lentivirus (a member of the retrovirus family) that causes acquired immunodeficiency syndrome (AIDS) (Douek *et al.*, 2009), a condition in human in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive. Human immunodeficiency virus (HIV) infection is a public health problem with socio-economic burden as well as threat for development (Bell *et al.*, 2003). Recent research indicates an estimated 33 million persons living with HIV, 94% of who are in low income countries (Joint United Nations Program on HIV/AIDS, 2008). A disproportionate number of AIDS deaths occur in Sub-Saharan Africa, retarding economic growth and exacerbating the burden of poverty (Greener, 2002). Malaria is prevalent in poor countries, occasional by poverty, caused by inadequate sewage treatment, poor hygiene's, and substandard housing

(Gallup and Sachs, 2001). Co-infection with HIV and malaria is very common in sub-Saharan Africa (Idemyor, 2007). Malaria and HIV are among the two most important global health problems of our times, together they cause more than four million deaths per year (Akinbo *et al.,* 2009). *Plasmodium falciparum* infection is endemic in most tropical countries and will definitely infect HIV patients living in this region at one time or the other during the course of their infection (Agbede *et al.,* 2009). Both diseases kill millions of people each year, and both diseases are scourges of developing nations in Africa, India, South East Asia and South America. HIV is pandemic; it spreads from person to person mostly by sexual contact in an increasingly mobile world (Lemey *et al.,* 2003).

MATERIALS &METHODS

Study area

The research was carried out at 44 Nigerian Army Reference Hospital Kaduna (44 NARHK). The samples were gotten mainly from the Voluntary Counseling and Testing (VCT) section of the hospital, where HIV tests are done. All the HIV patients studied here were of out-patient status. Permission was taken from the patients and the hospital authority through the Head of Department of the pathology laboratory before the commencement of the research. Blood samples were obtained from 250 individuals that came for HIV test at 44 NARHK, VCT center. Information like age, sex and social status was collected from patients who volunteered to get tested for malaria. Thick film smears were made on glass slides with frosted end (to facilitate labeling).A large drop of blood was place on a completely clean grease- free microscope slide and spread using the bottom of a plastic pipette to make the thick smear, covering an area of about 15mm just possible to see newsprint through the film. A thin film was also made by smearing a small drop of blood on one end of the slide, using another slide to spread the blood uniformly. Blood film smears were allowed to air dry before staining. The staining procedure was in accordance with Cheesbrough, (2005) standard procedure of staining, using 3% Giemsa stain. After staining the slides were rinsed with distilled water and kept vertical on the bench to dry at room temperature. The dried stained slides were viewed under microscope using 100 x objectives after the addition of a drop of immersion oil. The search for the parasite was done by viewing the edges and the tails of the films, since the parasite cells tend to be found more along these sites (Cheesbrough, 2005). The process of searching was characterized by continuous adjustment of the stage of the microscope to get different fields of a slide. The different stages of the parasite searched for includes the trophozoits, schizoints, gametocyte and merozoites. Film was considered positive (P+), which confirms the erythrocytic stage. Film was considered negative (P-), which means erythrocytic stage is absent (Cheesbrough, 2005). Statistical analysis of the results was done using Chi square and SPSS software.

RESULTS

Out of a total of 250 samples examined, 148 (59.20%) were found to be positive of malaria parasite. Amongst the 85 males, 40 (47.06%) had malaria parasite, while amongst the 165 females, 108 (65.45%) were infected with malaria (Table 1).

TABLE 1: Prevalence of malaria with respect to sex

Sex	No. of Samples (N)	No. Positive (%)	No. Negative (%)
Male	85	40 (47.06)	45 (52.94)
Female	165	108 (65.45)	57 (34.55)
TOTAL	250	148 (59.2)	102 (40.8)

The calculated value is 7.86 while the tabulated is x^2 = 0.00393 at 95% level of significance (7.86 > 0.00393), which means that sex not significant to the prevalence of malaria parasite in the HIV patient. Table 2 shows the age distribution of the infection among the HIV patients examined. Of the 250 HIV patients examined, no patient was below the age of 15 years. The highest prevalence of 77.39% was recorded among the age group 31-45 years, followed by 59.62% in the age group 46-60 years. The least prevalence of 7.69% was recorded among the age group 15-30 years.

TABLE 2: Prevalence of malaria with respect to age

Age group (year)	No. of Samples (N)	No. Positive (%)	No. Negative (%)
15 - 30	52	4 (7.69)	48 (92.31)
31 - 45	146	113 (77.39)	33 (22.61)
46 - 60	52	31 (59.62)	21 (40.38)
TOTAL	250	148 (59.2)	102 (40.8)

The calculated value is 77.13 while the tabulated is x^2 = 0.103 at 95% level of significance (77.13 > 0.103), which means that age not significant to the prevalence of malaria parasite in the HIV patient. Table 3 shows the prevalence of malaria with respect to social status of the patients. The patients were classified into 3 classes; the high class in which 81 patients were examined and 31 (38.27%) were positive to malaria. The middle class is the next class in which 65 patients were examined and 35 (53.85%) were positive; finally in the lower class, 104 patients were examined and 82 (78.85%) were positive to malaria.

TABLE 3: Prevalence of malaria with respect to social status

Social status	No. of Samples (N)	No. Positive (%)	No. Negative (%)
High class	81	31 (38.27)	50 (61.73)
Middle class	65	35 (53.85)	30 (46.15)
Lower class	104	82 (78.85)	22 (21.15)
TOTAL	250	148 (59.2)	102(40.8)

The calculated value is 27.54 while the tabulated is x^2 = 0.103 at 95% level of significance (27.54 > 0.103), which means that social status which is not significant to the prevalence of malaria parasite in the HIV patient.

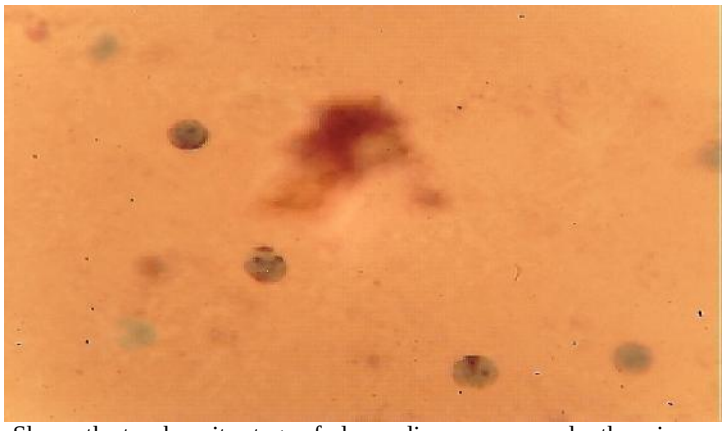

PLATE 1: Shows the trophozoite stage of plasmodium as seen under the microscope (x100)

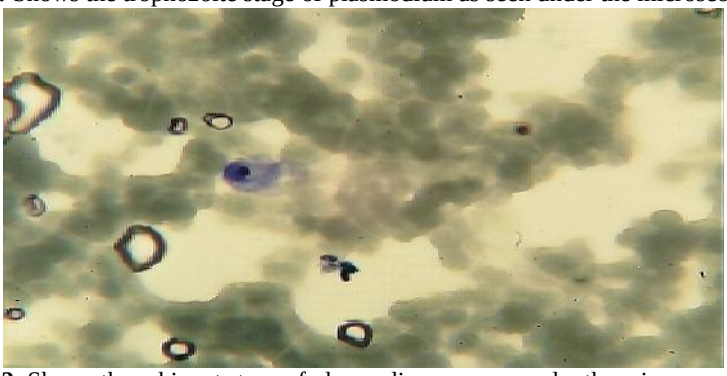

PLATE 2: Shows the schizont stage of plasmodium as seen under the microscope (x100)

DISCUSSION

Technological advancements on HIV/AIDS have so far succeeded in improving the CD4 counts of patients. This leads to improved immunity, which makes the patients live longer. Additional efforts would be required to improve the health status of HIV patients cohabited with malaria. From the present work it is evident that malaria prevalence was high among the HIV patients studied, 59.2%. This prevalence was considered high and quite worrisome. This is a reflection of the high rate of asymptomatic malaria parasitemia in malaria- endemic regions in tropical Africa, including Nigeria. A similar report was made by Achidi *et al.* (1995). The high prevalence was not unexpected too because HIV patients are known to have low body immunity, which render them vulnerable to several infections, including malaria. This work showed that malaria was more prevalent in females than males, (65.45% and 47.06%). The higher rate of malaria in females could be attributed to their social behavior, such as their dressing mode, which in most cases involves short sleeves and short skirts, thereby exposing parts of their bodies to mosquito attack. Also, females often stay out late during mosquito-biting hours carrying out domestic activities (Vlasloff and Bonilla, 1994; Brabin 1990). The age distribution of malaria parasite among the HIV patients in this study showed that the age bracket 31-45 years was most affected by the parasite (77.39%). This could be because the patients of this age bracket were very active and also preferred staying out late at night. Next was the age group 46-60 years with malaria prevalence of 59.62%. This is in line with the report of Okonko *et al*., (2010) who also reported the highest prevalence of malaria in age groups above 46 years, followed by age groups 16-30 years and 31- 45 years in Ibadan, Southwestern Nigeria. Our result as regards age distribution of parasitemia also correlates well with the findings of Atif *et al*. (2009) who reported infection rate to be higher among ages 12-35 years and 35-60 years of age in Pakistan. Social status was highly significant in this research. The low class studied here was made up of poor people that had the highest prevalence (78.85%). The prevalence was in agreement with (Adams and Margrate, 1975) who reported that the severity and duration of malaria attack depends on many factors among which include the

nutritional status of the host. Most of the patients screened were not enlightened so as to know preventive measures against malaria attack. Many of them did not use mosquito nets or prophylactic treatments. This can be justified from the high incidence recorded from patients of the low class, who are low or no income earners. Due to no steady means of income, proper feeding becomes a challenge which makes their body system highly vulnerable to infections including malaria. The high prevalence of malaria among the low class patients was also in agreement with Roll Back Malaria (2009), that malaria is understood to be both a disease of poverty and a cause of poverty.

CONCLUSION

In conclusion, this research has shown that malaria is very prevalent among the HIV patients in 44 Nigeria Army Reference Hospital Kaduna (44 NARHK), as high as 59.2%. The situation is quite alarming and calls for a constant routine diagnosis and treatment of malaria among HIV patients. Also more importantly is a need for health talks on malaria, and the need for good nutrition programme, at HIV clinics.

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