The Prevalence of Malaria Antigen In The Serum of HIV Seropositive Patients In Port Harcourt.

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ABSTRACT

Background: Malaria and HIV infections are now endemic in Sub-Saharan Africa. The morbidity and mortality of each infection is high in tropical Africa. Therefore, a co-infection of both will be expected to present a gloomy picture. The aim of this study was to determine the prevalence of adult HIV seropositive patients with malaria antigen.

Methodology: 300 adults who were HIV seropositive were randomly selected and screened for malaria antigen, using the rapid diagnostic test technique on blood obtained through a finger prick, in the clinic.

Results: A total of 79 patients were positive, with a prevalence of 26.5%.

Conclusion: The prevalence of 26.5% obtained is similar to that obtained in Jos, Nigeria (21%).There seems to be no difference in the prevalence rate of HIV infected patients with malaria and those that are seronegative for HIV.

Key Words: Malaria, HIV, seropositive, prevalence.

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INTRODUCTION

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 people die of malaria annually[1].

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[2]. 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[3].

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[4]. It is also worthy of note that Sub Saharan Africa is home to about 25million adults and children living with HIV/AIDS[2].

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 laboratory component[5].

There are presently five major species of Plasmodia that attack man, leading to the malarial disease. These are Plasmodium falciparum, Plasmodium ovale, Plasmodium vivax, Plasmodium malariae and Plasmodium knowlesi[6]. Each specie differs widely in morphology, characteristics, geographical distribution and clinical presentations[7]. 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)[8].

Owing to the overlapping distribution of HIV and malaria, interactions between them are likely. However, studies have shown conflicting reports[9-12]. There has been controversy whether there is even any relationship between them. In Uganda, Muller and Moser, found no relationship between malaria and HIV infection and reported a prevalence of 18% among pediatric and adult patients[13]. 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[14].

Igbeneghu and others 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 sulfadoxine-pyrimethamine intermittent preventive therapy in pregnancy has also been reported in Malawi[16].

It has now been established that HIV affects the susceptibility to malaria, its clinical course and also impairs antibody responses to malaria antigens[17]. What is also known is that HIV 1 infection affects malaria humoral immunity during pregnancy, but data for non- pregnant females are lacking[18].

The gold standard test for malaria diagnosis is microscopic examination of Giemsa stained thick and thin blood smears[19]. Although this method is a fast and inexpensive diagnostic procedure, it is largely dependent on the competence of the microscopist. Achieving high sensitivity requires counting up to 100 microscopic fields which is time and labour 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[20].

These rapid diagnostic test kits are said to be highly sensitive and specific[21]. Their use may soon become an integral diagnostic method in Nigeria due to the ease of testing, non reliance on microscopist skill, the non requirement of electricity supply which may not be readily available in contrast to microscopy in addition to, their added high sensitivity and specificity for malaria [21]. In spite of the more quantitative than qualitative estimation of malaria associated with their use.

Port Harcourt, the capital of Rivers state, in Nigeria, also shares in the burden of HIV/AIDS and malaria endemicity. However, there is no known data on the prevalence of malaria in HIV seropositive adults living in the city. This research, which is a hospital based study, is aimed at determining the prevalence of malaria antigenemia among HIV infected adults in Port Harcourt.

METHODOLOGY

Three hundred (300) adults (200 females and 100 males) who were confirmed HIV seropositive patients, attending the HIV/AIDS clinic between August-September 2010, were randomly recruited on a consecutive basis following informed consent and screened for malaria using finger prick blood with the malaria Rapid Diagnostic Test (RDT) kit.

The samples were randomly collected from patients that met the inclusion criteria between August and September, 2010, when the research was done. Those who participated are the patients that consented to being part of the study and met other criteria of the study design. The inclusion criteria were: (1) Adults who were HIV positive. (2) Those that have not had any antimalarial drugs three four weeks before presentation. (3) Those that were treatment naïve for HIV.

The exclusion criteria were: (1) Pregnant female HIV patients. (2) Those that were on any antimalarial drugs. (3) Children. (4) Those that are on any highly active anti retroviral therapy.
The study was on adult males and females who attended the adult HIV clinic. The pregnant women and children have their own HIV clinics. These patients were HIV treatment naïve patients but other data such as $CD4^+$ count and individual ages where not considered, since they were not part of the focus of the study.

Rapid Diagnostic Test (RDT) kit was used. This is a Plasmodium Lactate Dehydrogenase enzyme (PLDH) containing substance. It is a 33kDa oxidoreductase and it is the last enzyme of the glycolytic pathway essential for ATP generation and one of the most abundant enzymes expressed by Plasmodium falciparum. PLDH does not persist in the blood but gets cleared about the same time as the parasites following successful treatment.

The test kits were quality controlled before usage. The sensitivity of the test kit was stated to be 100% while the specificity was said to be 99% (by the manufacturer). The validity was certified before usage[7].

The procedure uses 0.5ml of whole blood of the patient that is mixed with diluents in a well of the cassette. The red blood cells are lysed by the diluents, releasing the malaria parasite antigens, which react with the antibody that was embedded on the well. A positive result gives two colored lines (for test and control); while a negative result gives a colored line. The result is read after 15-30 minutes of commencement of the procedure[22].

All tests were done in the HIV/AIDS clinic after the patients had consented to be part of the study at no cost to the patients. All positive cases were treated but the patients paid for their drugs.

RESULT

The mean age of the study was 24 years and the age range was from 18 years to 45 years. The age group distributions were: 18 23 years (30), 24-28 years (120), 29-34 years (100), 35-39 years (30) and 40-45 years (20). The gender ratio was 2:1 in favour of females.

A total of 79 patients were positive for malaria parasite giving a rate of 26.5 %.

Out of the 100 men that were screened 27 of them were positive while 52 of the 200 women were positive for malaria.

The males had 27% positivity for malaria while the females have 26% positivity for malaria. There was no significant difference between males and females that were positive for malaria. ($P < 0.05$).

DISCUSSION

The study had more females than males in a ratio of (2:1). It was not surprising that more females were infected with malaria than males.

The prevalence of malaria among HIV infected patients who attended the HIV clinic between August and September 2010, at the University of Port Harcourt Teaching Hospital was 26.5%. This prevalence is comparable to what was reported by Francine H, et al with a prevalence of 25.6%, though obtained in pregnant women in Uganda[14]. The research excluded both pediatric and pregnant patients because, this group of patients, receive their medications for HIV/AIDS from different clinics. Moreover, pregnancy may be an added immune suppressor.

However, the prevalence differs with the work of Addisie and others in Debub University in Ethiopia[23], where they discovered that the prevalence of HIV in malaria patients was 4.2%. The higher prevalence obtained here may be due to the high sensitivity and specificity of the rapid diagnostic test used. While Addisie and others used light microscopy of stained slide films, the competence of the microscopist and the antigenemic level of malaria within the population sampled should explain the low prevalence in that study.

The work of Uneke CJ[24] and his colleagues in Jos, Nigeria produced a prevalence of 21%. This is a more comparable result with this study than that of Addisie and others. This similar prevalence obtained in Jos and Port Harcourt may be due to the fact that malarial endemicity is higher in Nigeria than in Ethiopia. It is known that rapid diagnostic tests for malaria is not the gold standard but it is more convenient, easy to perform and the results obtained are comparable to those of microscopy if the test is correctly done. One group of patients that may vary the result is those with rheumatoid arthritis because they have rheumatoid factor in their blood which could lead to false positive results[25]. There were no reported

cases of rheumatoid arthritis despite not being an exclusion criterion. Therefore, the prevalence from this study cannot be said to have been significantly increased by the effect of rheumatoid factor. Finally, comparing the prevalence of this study with other studies, it is similar to what have been reported in the general population, despite not having a control group of the unaffected population.

The prevalence of malaria in HIV patients in males was slightly higher than that of females (27% and 26%) respectively.

CONCLUSION

The prevalence of malaria in HIV infected patients who attended University of Port Harcourt Teaching Hospital between the stated periods is 26.5%. This is similar to other reported studies done previously.

This figure can be reduced further if the malaria eradication program of the Rivers state government is embraced by everyone within the state.

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