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Prevalence of Human Immunodeficiency Virus and Malarial Coinfection in parts of Delta State, Nigeria

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Abstract
A total of two hundred and five (205) patients suspected of human immunodeficiency virus infection were studied to determine the human immunodeficiency virus and Malarial associated infections in Kwale, Agbor and Eku in parts of Delta State, Nigeria. Human immunodeficiency virus status and malaria parasite were determined using (WHO) systems two and Field staining technique respectively. Malaria parasite was further confirmed with Giemsa staining technique. Human immunodeficiency virus and malaria infections were statistically significant (P<0.05) among suspected subjects. Prevalence of 53.20% and 5.86% were obtained for human immunodeficiency virus and malaria infections respectively. Malaria infection was significantly lower (P<0.05) among human immunodeficiency virus infected subjects in the study area. Meanwhile, prevalence of 2.7% and 4.6% were observed for malaria infection among human immunodeficiency virus infected subjects in Kwale and Agbor respectively. Thus, malaria infection remains a compounding factor in human immunodeficiency virus infection.

Keywords: Prevalence, Health, HIV, Malaria, Delta, Nigeria.

INTRODUCTION
The association between human immunodeficiency virus (HIV) and malarial has important implications. These are two of the most common infections in sub-Saharan Africa and other developing countries of the world (UNAIDS, 2004). It is estimated that 38 million Africans are infected with HIV, and 300 to 500 million suffer from malaria annually (WHO, 2005).

Malaria does not behave like an opportunistic infection, still the detail of the interaction between HIV and Malaria are widely known. Human immunodeficiency infected pregnant women appear to have higher malaria risk and the coinfection in pregnancy is associated with increased parasitaemia and higher incidence of prematurity as well as low birth weight (Ayisi *et al.,* 2003; Terkuile *et al.,* 2004). Studies in non pregnancy adults show that the underlying epidemiology and intensity of malaria transmission seem to be critical for determining the rates of coinfection. In endemic areas, malaria transmission is intense and continuous inspite of seasonal variations (Whitworth *et al.,* 2000; French *et al.,* 2001; Francesconi *et al.,* 2001). Human immunodeficiency virus related immune supression may increase rate of malarial infection and clinical malaria disease, however there is clear evidence of an increase rates of severe complicated malaria. The odds of parasitaemia and risk of malaria fever increase with decreasing CD4 count and increasing viral loads (French *et al.,* 2001; Patnaik *et al.,* 2004).

These findings suggest that there may not be interference with parasite control, which protect persons with parasitaemia from clinical disease. Thus, the impact of HIV coinfection on the disease presentation may lead to severe malaria and death (Chirenda *et al.,* 2000; Cohen *et al.,* 2002; Grinwade *et al.,* 2004).

On population basis an increased prevalence of malaria and increased parasite density in human immunodeficiency virus infected individuals could lead to increased malaria transmission affecting both human immunodeficiency virus positive and negative individuals. In parts of Southern Africa with human immunodeficiency prevalence of 30%, the population attributable to malaria parasitaemia was 20% (Whitworth *et al.,* 2000).

Thus, this study was conducted to assess the health point prevalence of malaria parasite infection among HIV infected subjects so as to reduce mortality rate association with HIV-malaria related death in Delta State, Nigeria.

MATERIALS AND METHODS

This study was conducted in three foci of Delta State with Voluntary Testing and Counselling facilities namely Central Hospital Kwale, Central Hospital Agbor. Tuberculosis and Leprosy Referral Centre Eku in Delta State, Nigeria. The study areas of Agbor, Eku and Kwale lies approximately between longtitude $5^{o}.00$, and $6^{o}.45'$ East and latitude $5^{o}.00'$ and $6^{o}.30'$ North of Delta State. The population of the study area are: Agbor: 109,204; Eku:113,929 and Kwale:144,117 (World Gazetteer, 2007).

Venous blood was collected from 205 patients suspected of Human immunodeficiency virus by random sampling into EDTA containers after informed consent. Subject less than 10years were not presented during the Course of the study and all known HIV positive subjects were excluded. All samples were analysed immediately after collection at the designated centres.

Human immunodeficiency virus screening was carried out using enzyme linked imminosorbent assay rapid screening kits based on WHO systems two for detecting antibodies to HIV-1 and HIV-2 (Kassler *et al.,* 1998). Determine rapid screening kits (Abbott Laboratories, Japan) and immunocomb II (Organics, France) were used in this study. Test was carried out according to manufacturer's instruction.

Malaria parasites was determined by field staining technique and further confirmed with Giemas staining (Cheesbrough, 2000).

Data generated were presented in tables and analysed statistically using chi-square.

Ethical consideration for permission/approval was obtained from the ethical committee of the Delta State Ministry of Health and the hospitals located in the three foci where the study was carried out.

RESULTS

Out of 205 suspected subjects that were examined for HIV and Malaria infections; 109 (53.20%) were HIV positive and 12 (5.86%) were malaria parasite positive. The HIV and malaria infected subjects were statistically significant ($P<0.05$) among the suspected subjects (Table 1). Prevalence of 2.7% and 4.6% were recorded for Kwale and Agbor foci respectively for malaria infection among HIV infected subjects. However, the malaria infected subjects were significantly lower ($P<0.05$) among HIV infected subjects. There was no malaria positive observed in Eku among HIV infected subjects (Table 2).

TABLE 1: Prevalence of Malaria and HIV infected subjects in the study.

Number tested (n=205)	No. positive (%)	No. negative (%)	X^2	p-value
HIV	109 (53.2)	96 (46.8)		
Malaria	12 (5.86)	193 (94.14)	110.3	3.841
Total	121	289		

df=1; P< 0.05

TABLE 2: Malaria infections among HIV infected subjects in the 3 foci studied

Foci	No. of HIV positive (n) (%)	No. of malaria parasite positive %	No of malaria parasite negative %	% Prevalence rate	X^2	p-value
Kwale	40	3(7.5)	37(92.5)	2.7		
Agbor	47	5(10.6)	42(89.4)	4.6		
Eku	22	0 (0.0)	22 (100.0)	0.0	25	5.991
Total	109	8 (7.3)	101 (92.7)	7.3		

df=2, P<0.05

DISCUSSION

Human immunodeficiency virus and malaria have earlier been reported by UNAIDS (2004) as the most common infections in Sub-Saharan Africa and other developing countries of the world. In this study, human immunodeficiency virus and malaria infections were found to be statistically significant (P<0.05) among suspected subjects. This confirms the fact that Human immunodeficiency virus and malaria infection is still a problem in developing countries. Though the prevalence rate of 53.20% recorded for human immunodeficiency virus infection is far higher than 5.86% observed for malaria infection. This findings however, disagree with the reports of UNAIDS (2004) and WHO (2005) that the estimated 38 million of Africans are infected with human immunodeficiency virus, whereas 300 to 500 million suffer malaria infection. This may be attributed to the availability of anti-malaria drugs in clinics, pharmaceutical sales and distribution outlets, health centres and preventive measures such as insecticides treated nets and proper environmental cleanup.

Prevalence of 5.86% obtained for malaria infection in this study is far lower than the 20% observed for malaria parasitaemia in Southern Africa in the study carried out by Whitworth *et al* (2000). The difference maybe as a result of Nigeria government priority in eradicating malaria infection through her roll back malaria programme, increased level of environmental sanitation exercise and mass literacy campaign. However, the reports of Whitworth *et* al (2000); French *et al* (2001) and Francesconi *et al* (2001) have shown that seasonal variation may also contribute to continuous and intense transmission of malaria. The prevalence of 7.3% obtained for malaria among human immunodeficiency virus infected subjects was an indication that malaria is still a compounding factor in human immunodeficiency virus in the study area. Though, human immunodeficiency virus associated malaria infection were significantly low (P<0.05) in the study; there is need for recognition of the association between human immunodeficiency virus infection and clinical malaria as earlier opined by Whitworth *et al* (2000).

In this study, no malaria positive subjects were reported in Eku; this might probably be due to a number of factors such as publicity; sales and presence of distribution outlets for the use of insecticide treated net and availability of retreatment facilities at the Eku environment such as Baptist Mission Hospital, Eku.

CONCLUSION

In conclusion, since malaria infection remains a compounding factor in human immunodeficiency virus infection in this study÷ there is need for prophylaxis treatment of malaria infection on all suspected and human immunodeficiency virus infected subjects so as to reduce human immunodeficiency virus-malaria related death in Nigeria.

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