



Use of Long-Lasting Insecticidal-Bednets among People Living with HIV/AIDS Accessing Care in a Tertiary Health Facility in Southwest, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. Authors HAE and GOD designed the study and wrote the manuscript. Author TEA played role in data collection. Authors AOO, AAA, OO, OOA, AE and EFA provided assistance. All authors read and approved the final manuscript.

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ABSTRACT

Co-infection of HIV with certain diseases like pulmonary tuberculosis and malaria increases the morbidity and mortality of people living with HIV/AIDS. HIV-malaria co-infection has been regarded as having a synergistic effect on the patient. The former increases the patient's vulnerability to

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parasitic and microbial infections, due to compromised immunity, while malaria on its part, further lowers an already diminished immunity by negatively impacting CD4 lymphocytes. In a nutshell, HIV-malaria co-infection is a collaboration that must not be allowed to take place in persons living with HIV/AIDS. One way to do this is to encourage HIV infected persons to sleep under long-lasting insecticidal nets (LLIN). In this retrospective study, covering a decade at a tertiary health facility in the southwest, Nigeria, requisite data on 303 confirmed HIV positive subjects were retrieved and reviewed. Two hundred and twenty-one (73%) of the subjects were females, while 82 (27%) were males. The mean age of the subject was 41.7 while 42 was the modal age. Ten (3.3%) of the subjects fell within 16-25 years age-bracket, 74 (24.42%) fell within 26-35 age-bracket, while, 118 (38.94%), 71 (23.43%), 26 (8.58%) and 4 (1.32%) respectively fell within 36-45, 46-55, 56-65 and 66-75 age-brackets. Only 6 (2%) of the cases were new HIV infections, whereas, 70 (26%) had been infected for upwards of 9 years and had been on HAART (highly active anti-retroviral therapy) ever since then. About half 147 (48.5%) of the subjects didn't disclose at enrolment into the free treatment scheme if they used LLIN or did not use it. However, out of the remaining 156 who did make a disclosure, 148 (94.9%) used LLIN, while 8 (5.1%) did not. The study also revealed that male subjects were likelier than the females to use LLIN.

Keywords: Malaria; insecticide-treated net; Ekiti; PLWHAA; HAART.

1. INTRODUCTION

Long-lasting insecticidal nets (LLIN) are bednets that have been impregnated with an insecticide designed to repel and kill mosquitoes as well as other insects. They offer a form of personal protection that has been shown to reduce illness, severe disease and death due to malaria in endemic regions [1].

Although the numbers of cases and deaths attributed to malaria have witnessed a decline recently, the disease still presents a huge health and economic burden to people living in Sub-Sahara Africa (SSA) which is also the region most affected by HIV pandemic [2].

Malaria and HIV/AIDS are leading causes of morbidity and mortality in SSA. These two diseases are highly endemic in Nigeria [3]. As a devastating public health problem, malaria in combination with HIV/AIDS is responsible for more than two million deaths annually [4]. Malaria infects about three hundred million people yearly resulting in about one million deaths. Generally, children below five years of age, pregnant women, non-immune visitors and People living with HIV/AIDS (PLWHA) are at greatest risk of severe illness [5]. On the other hand, about 30 million people are infected with HIV in Africa, resulting in more than three million deaths [4].

Nigeria accounts for 25% of all malaria cases in the World Health Organization, African Region.

This disease is endemic in all the six geopolitical zones of the country with 90% of the total population at risk of stable malaria [6].

HIV and malaria infections are thought to have a synergistic effect. While HIV increases the risk of malaria by increasing the proportion of severe cases, case fatality and antimalarial resistance; malaria, on the other hand, bring about a rapid decline in CD4⁺ T-cells count and elevation of HIV viral load resulting in increasing immunosuppression [3]. The risk of severe anaemia is also higher in HIV person co-infected with malaria [7].

The use of LLIN is one of the global strategies to practically and effectively reduce the burden of malaria among the people living with HIV/AIDS [8]. Long-lasting insecticidal-nets do not only prevent mosquito bite but also kills mosquitoes thereby reducing vector density with a resultant reduction in the incidence of malaria [8].

Long-lasting insecticidal-nets offer 70% protection when compared with no nets. They have also been found to reduce clinical malaria by 50% and reduce mortality in children by 15-30% when overall population coverage is up to 70% [7].

Over the years, there has been a free donation of LLIN (by NGOs and development partners) in all the 36 states of the country and the federal capital territory. However, LLIN utilization is generally low in some parts of the country and thus requires strict monitoring in order to beat down the morbidity and mortality arising from

these dual menaces of HIV and malaria [9]. Hence, this study was conducted to assess the usage of LLIN among PLWHA accessing treatment, care and support in a tertiary health facility in Ekiti State, Nigeria.

2. MATERIALS AND METHODS

2.1 Study Population

The study population comprised 303 confirmed HIV positive subjects who were all on highly active anti-retroviral therapy at a tertiary health facility in the southwest, Nigeria. Data of patients who had a confirmed diagnosis of HIV and were on HAART were consecutively sampled for the study.

2.2 Data Mining

Being a retrospective study of HIV positive persons assessing care in a tertiary health facility over the past decade (2008-2017, the requisite data (other than their names) about the subjects were manually obtained (February-March, 2018) through the health information management department of the hospital.

2.3 Data Analysis

Data obtained were subjected to statistical analysis using Ms-Word and online statistical calculator.

3. RESULTS

The subjects comprised 221 (73%) females and 82 (27%) males (Table 1).

Table 1. Subjects' gender distribution

Male	82 (27)
Female	221 (73)
Total	303 (100)

Ten (3.3%) of the subjects fell within the 16-25 years age-bracket, 74 (24.42%) fell within the 26-35 age-bracket, while 118 (38.94%), 71 (23.43%), 26 (8.58%) and 4 (1.32%) respectively fell within the 36-45, 46-55, 56-65 and 66-75 age-brackets. The mean and modal ages of the subjects respectively were, 41.7 and 42 (Table 2).

Six (approx 2%) of the cases were new HIV infections. The length of infection of the remaining subjects was; 2, 3, 4, 5, 6, 7, 8, 9 and 10years, with the following frequencies

respectively; 5, 3, 6, 4, 28, 68, 66, 79 and 34 (Table 3).

Table 2. Subjects' Age Distribution

Age-bracket	Frequency
16-25	10
26-35	74
36-45	118
46-55	71
56-65	26
66-75	4
Total	303

Table 3. Length of Infection

Length of year	Frequency
≤1	6
2	5
3	3
4	6
5	4
6	28
7	68
8	66
9	79
10	34

About half, 147 (48.5%) of the subjects did not disclose at enrolment into the free treatment scheme if they used or did not use LLIN (Insecticide-treated nets). Out of the remaining 156 who made a disclosure at enrolment as regards the use of LLIN, 148 (94.9%) used LLIN (that always sleeps under LLIN mosquito-net), while 8 (5.1%) were not using LLIN (Table 4). Among those who were not using LLIN, 7 (87.5%) were females while 1 (12.5%) was a male.

Out of the 148 subjects who slept under LLIN, 29 were males, while 119 were females. Also, 7 out of the 8 subjects who didn't sleep under LLIN were females, while the remaining subject was a male (Table 5)

Table 4. Use of LLIN

	Yes	No
Didn't supply data on the use of LLIN	147	
Used LLIN	148	8
Total	303	

Table 5. Distribution of LLIN-users by gender

	Yes	No	Total
Male	29	1	30
Female	119	7	126
Total	148	8	156

4. DISCUSSION AND CONCLUSION

The synergistic effect of HIV and malaria parasitemia co-infection on a patient could be debilitating. HIV ruins CD4 lymphocytes and lowers immunity, while malaria parasitemia ruins the erythrocytes, aside from its other many pathological effects on the patient [10,11]. Each being a kind of killer-disease on its own right, HIV-malaria co-infection is one that efforts must be made to prevent.

And one safe and simple yet affordable means of achieving this among PLWHA is to encourage and monitor the use of LLIN among them. Gamble et al. [12] reported that the use of LLIN during pregnancy was able to reduce placenta malaria by 23% and foetal death by 32%. It has actually been estimated that twenty-three million pregnancies are unprotected by LLIN in sub-Saharan Africa [13]. The demographic finding of this present study is in agreement with many other studies that women disproportionately bear the brunt and burden of HIV/AIDS, particularly in Africa [14]. As in other similar studies, in this present study, 73% of the subjects were females- mostly in their reproductive and economic ages.

The outcome of this study reveals that an outstanding majority 95% used LLIN. This is very similar to the findings of Cohee et al. [15] in Rakai, Uganda. In their study on the use of LLIN distributed free to PLWHAA, they recorded 91% utilisation rate among the PLWHA. In a study conducted in Bahir City, Northwest, Ethiopia, Yibeltal et al. [16] reported a 76.8% utilisation rate of LLIN among the surveyed PLWHA. They equally reported the excuses given by those who didn't use LLIN as; not knowing where to obtain LLIN (41.7%), the high cost of LLIN (33.3%) and being not worried about mosquito bites (65.3%). In a similar survey in three sites in Kilifi, Kisii and Kisumu, Kenya, Obinna et al. [14] also reported that majority (76.9%) of the PLWHA surveyed used LLIN [16].

Furthermore, the findings of this study show that gender is a predictor of who is likelier or not to use LLIN among the study population, as 87.5%

of those that did not use LLIN among the subjects were females. Garley et al. [17] in a post-campaign survey (after universal distribution of free LLIN) in Kano State, Nigeria, also discovered that 57.2% of the females and 48.8% of the males used LLIN. After controlling for covariates, they came to the conclusion that females were likelier to use LLIN than their male counterparts.

Judging from the outcome of this study, it can be concluded that the efforts of health educators are yielding positive results, as 95% of the subjects regularly slept under LLIN. It is therefore suggested that the current advocacy campaign to ensure that PLWHA access proper care should be sustained.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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