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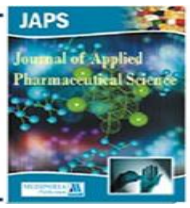

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Knowledge and use of insecticide treated nets as a malaria preventive tool among pregnant women in a local government area of Lagos state, Nigeria

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ABSTRACT

Malaria has been described as the foremost public health concern in tropical and sub-tropical regions of the world, Nigeria inclusive. This survey set out to assess the knowledge, attitude and practice on the use of ITNs as a malaria preventive tool among pregnant women and to determine its level of recommendation and proper instructions given by pharmacists. Structured questionnaires were administered to pregnant women attending antenatal clinics at two selected hospitals in Alimosho Local Government Area (ALGA) of Lagos State and also to community pharmacists practicing in the same ALGA. Data was analyzed using Epi Info 2002 and Microsoft Excel. Forty eight community pharmacists and 163 pregnant women participated in the study. About 77 and 91% of pregnant women were aware of ITNs at Igando GH and the private hospital respectively. Only 11.2% and 37.5% actually used it. Majority of the pharmacists (95.8%) recommended the use of ITNs and 95% of them also gave counsel on ITN use while 5% did not. There is a wide difference between the level of awareness and the rate of use of ITNs by pregnant women. More emphasis should be placed on ownership and use of ITNs so that the benefit of its protection can be derived.

Key words: ITNs, Alimosho Local Government Area (ALGA), Igando General Hospital (IGH), Private Hospital (PH), Pregnant women.

INTRODUCTION

Malaria is a life-threatening parasitic disease transmitted by mosquitoes. It was once thought that the disease came from fetid marshes, hence the name malaria (bad air). In 1880, scientists discovered the real cause of malaria; a one-cell parasite called plasmodium. Later, they discovered that the parasite is transmitted from person to person through the bite of a female anopheles mosquito, which requires blood to nurture her eggs (WHO 2002a). There are four species of Plasmodium that transmit malaria in humans. They are *P. falciparum, P.vivax, P. malariae and P.ovale*. Infections with *P. falciparum* however are the most deadly. Today, approximately 40% of the world's population mostly those living in the world's poorest countries are at risk of malaria. In most endemic regions of the world, pregnant women are the main adult risk group for malaria. Every year, about 30 million pregnancies occur among women in malarious areas of Africa, most of who reside in areas of relatively stable malaria transmission. In these areas, *P. falciparum* infection during pregnancy is estimated to cause as many as 10,000 maternal deaths each year, 8% to 14% of all low birth weight babies, and 3% to 8% of all infant deaths(WHO 2002b). In Nigeria, malaria accounts for 40% of disease burden, 30% of all childhood deaths, and 11% of maternal deaths (RBM 2004).

Malaria infection during pregnancy results in adverse effects on both mother and fetus: these include maternal anemia, fetal loss, premature delivery, intrauterine growth retardation, and delivery of low birth weight infants (<2.5kg or 5.5 pounds). It is a particular problem for women in their first and second pregnancies and for women who are HIV positive.

For the prevention and control of malaria during pregnancy in sub Saharan Africa, the World Health Organization (WHO) currently recommends a three pronged approach to prevent the adverse effects of malaria in pregnancy in areas with high levels of transmission of *Plasmodium falciparum* malaria. They are:

- Use of insecticide- treated bed net (ITN)
- Intermittent preventive treatment (IPT) with anti-malarial drugs
- Febrile malaria case management.

Each of these interventions is considered safe, effective, affordable, and deliverable.

A study in an area of high malaria transmission in Kenya showed that women protected by ITNs every night during their first four pregnancies produce 25% fewer underweight or pre mature babies. ITNs should be provided to pregnant women as early in pregnancy as possible, and their use should be encouraged for women throughout pregnancy and during the Post partum period. ITNs are also efficacious in reducing maternal anemia and placental infection (Garner et al 2002).

There are basically two types of insecticide treated nets:

- conventional Insecticide Treated Nets (ITNS) which usually contain a sachet of insecticide and needs to be treated by users or health care workers before use. These should be re-treated every 6-12 months.
- Long Lasting Insecticidal Nets (LLINs). i.e. those already treated by manufacturers (CDC 2006). A LLIN should be expected to retain biological activity for at least 20 washes and/or 3years of recommended use (WHO 2005).

In 9 countries surveyed between 1997 and 2001, a median 13% of households possess one or more nets, while a median 1.3% of households surveyed own at least one ITN (Africa Malaria Report 2003). Likewise in a survey carried out in Nigeria in the 2003 Nigeria Demographic and Health survey, it was reported that ownership of mosquito nets was not wide spread. Only 17% (12% in 2003) of households reported ownership of at least one mosquito net, while 8% (2% in 2003) reported ownership of an ITN (NDHS 2008). Insecticide-treated bed nets (ITNs) are now an important method for controlling malaria. Their protective effect will be strongest if they are used by a high proportion of the population at risk (CDC 2007).

The fact that in most African countries over 70% of pregnant women make multiple antenatal clinical visits provide a major opportunity for prevention of malaria, along with other priority diseases affecting pregnant women. However, the awareness and use of these tools vary from community to community in Nigeria where they have been used. This study set out to assess the knowledge, attitude and practice on the use of ITNs, its awareness and acceptance as a malaria preventive tool among pregnant women in Alimosho local government area. Also assessed was the level to which community pharmacists recommend insecticide treated nets to the pregnant women as compared to other malaria preventive tools and the extent to which counsel on the use of insecticide treated nets is given to them.

MATERIALS AND METHODS

STUDY AREA: Alimosho Local Government Area in Lagos State was selected for this study due to its large population area and habitation by diverse groups of people. It has about 65 registered pharmacies scattered around different locations. It is also home to a large number of pregnant women per time.

STUDY DESIGN: Descriptive and Cross Sectional.

DATA COLLECTION: Structured questionnaires were administered to all the pharmacists, as well as to a cross-section of the pregnant women in the area. Two hospitals, a private hospital (PH) and a government hospital, Igando General Hospital (IGH) were selected to administer the questionnaire to pregnant women, so as to give an adequate representation of the pregnant women in the area. All the pregnant women who attended ante natal clinics on the days on which the questionnaires were administered were sampled. The questionnaires for the pharmacists were administered to them in their pharmacies.

The questionnaires were designed to answer the objectives of the study.

DATA ANALYSIS: Data analysis was carried out using Epi Info 2002 and Microsoft Excel.

RESULTS

Among the 65 pharmacists sampled, 48 responded giving a response rate of 74%. The pregnant women that participated in the study were 163. Table 1 shows the modal age and educational level of respondents as 29 years and tertiary education respectively. About 77% and 91% of the pregnant women were aware of ITNs at IGH and the PH respectively. Also 16% and 55% of them respectively own an ITN, while 11% and 37.5% actually use it (Table 1). Sources of information about ITN's ranges from parents and friends (6.9-10.4%), to the Mass Media (24.1-38.3%), and healthcare workers (53.9-65.5%) in Table 2. Pregnant women's use of malaria preventive tools showed that they favored the use of door and window nets, keeping their environment clean, and use of insecticide sprays above the use of insecticide treated nets (Table 2). The reasons the pregnant women gave for not using ITNs were not believing it works (5.7-6.3%), do not need it since they have door and window nets (14.3-14.7%), cannot afford it (5.3%), not available (5.7-7.4%), no space to hang it (5.7-12.6%), makes them sweat (5.3-20%), makes them feel suffocated (5.7-9.5%) and have just heard of it (35.8-42.9%) (Table 2).

Table 1: Age, Educational level, Awareness, Ownership and Use of ITNs

	IGH	PH	
	n (%)	n (%)	
AGE			
16-20	4 (3.7)	1 (1.8)	Modal Age
21-25	10 (9.3)	11 (19.6)	
26-30	46 (43.0)	30 (53.6)	29 years
31-35	28 (26.2)	10 (17.8)	(p=0.13)
36-40	16 (15.0)	3 (5.4)	
41>	3 (2.8)	1 (1.8)	
EDUCATIONAL LEVEL			
PRIMARY	6 (5.6)	5 (8.9)	Modal Education
SECONDARY	45 (42.1)	13 (23.3)	TERTIARY
TERTIARY	56 (52.3)	38 (67.9)	(p=0.055)
AWARENESS			
NO	25 (23.4)	5 (8.9)	
YES	82 (76.6)	51(91.1)	(p = 0.041)
OWNERSHIP			
NO	90 (84.1)	25 (44.6)	
YES	17 (15.9)	31 (55.4)	(p = 0.0000004)
USE			
NO	95 (88.8)	35 (62.5)	
YES	12 (11.2)	21 (37.5)	(p = 0.00017)

Table 2: Source of information, Use of preventive tools and reasons for not using ITN

	IGH	PH	
	n (%)	n (%)	
SOURCE OF INFORMATION			
Parents/Friends	8 (6.9)	6 (10.4)	
Media	44 (38.3)	14 (24.1)	(p = 0.237)
Healthcare workers	62 (53.9)	38 (65.5)	
Others	1 (0.9)	0 (0.0)	
USE OF MALARIA PREVENTIVE TOOLS			
Intermittent Preventive Medicine	41 (37.6)	13 (22.8)	
Door and window nets	70 (64.2)	29 (50.9)	(p = 0.0038)
Insecticide Sprays	46 (42.2)	22 (38.6)	
Insecticide treated Nets	12 (11.2)	21 (37.5)	
Ordinary Bed Nets	5 (4.6)	0 (0.0)	
Mosquito coils	16 (14.7)	4 (7.0)	
Mosquito Repellant creams	6 (5.5)	2 (3.5)	
Keeping your environment clean	66 (60.5)	33 (57.9)	
REASONS FOR NOT USING ITNs			
Does not believe it works	6 (6.3)	2 (5.7)	
Has window and door nets already	14 (14.7)	5 (14.3)	(p = 0.202)
Cannot afford it.	5 (5.3)	0 (0.0)	
Not convenient to re-treat	3 (3.2)	0 (0.0)	
Not available in my area	7 (7.4)	2 (5.7)	
No space to hang it	12 (12.6)	2 (5.7)	
Makes me sweat	5 (5.3)	7 (20.0)	
Makes me feel suffocated	9 (9.5)	2 (5.7)	
Have just heard of it	34 (35.8)	15 (42.9)	

From the results obtained, 46 (95.6%) of the pharmacists recommended ITNs to pregnant women as a malaria preventive method (Figure 1). Other methods recommended were Insecticide sprays (27.1%), Intermittent preventive medicine (81.3%), window and door nets (77.1%), environmental cleanliness (85.4%), mosquito repellant cream (27.1%) and mosquito coils (16.7%). Also, 95% of pharmacists gave counsel on ITN use to the pregnant women while 5% did not (Figure 2), and of all the methods recommended by pharmacists to pregnant women, ITNs were the most always recommended tool as shown in Figure 3.

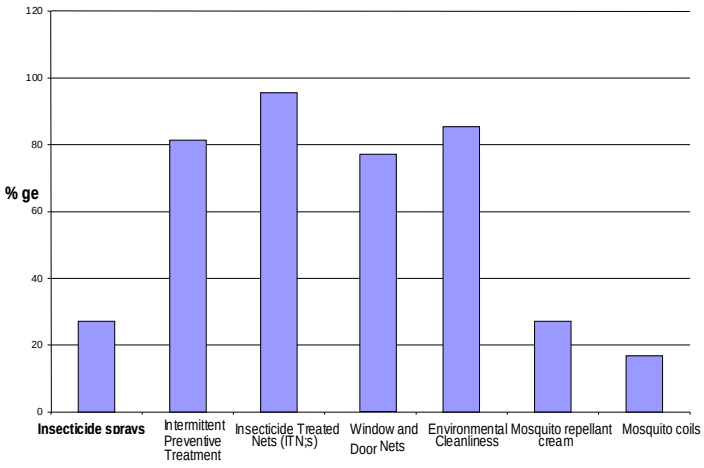

Fig 1: MALARIA PREVENTIVE METHODS RECOMMENDED BY PHARMACISTS.

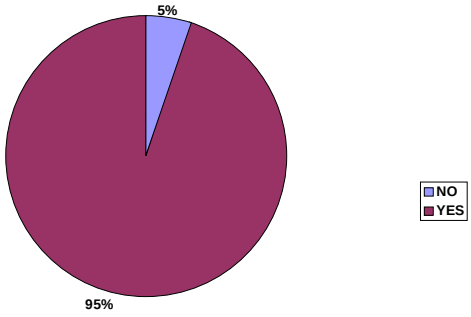

Fig. 2: GRAPHICAL ILLUSTRATION OF PHARMACISTS WHO COUNSEL ON ITN USE.

DISCUSSION

This study shows a high level of awareness of ITNs as a malaria preventive tool by the two groups of pregnant women in this LGA. This is in agreement with Isah et al (2009), and Iwu et al (2010) who both reported a high level of awareness among pregnant women attending ANC in a tertiary health care facility in north-western Nigeria and Owerri, Imo state respectively. In contrast, Musa et al (2009), and Adeyemi et al (2007), in their study reported low levels of awareness of ITNs among pregnant women attending ANC in a northern state in Nigeria, and Oshogbo, a south western state in Nigeria respectively.

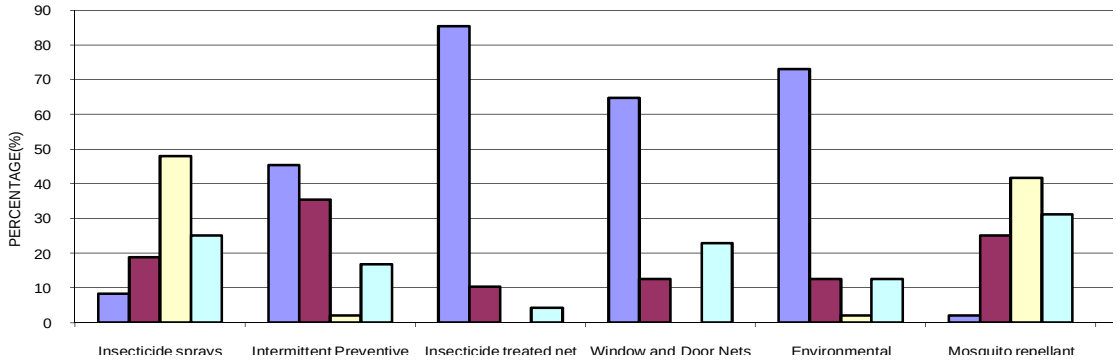

Fig 3: GRAPHICAL COMPARISM OF THE LEVEL OF RECOMMENDATION OF EACH METHOD

However, the level of ownership was found to be high among pregnant women attending ANC at the private hospital while it was low among those attending ANC at the General hospital. Iwu et al (2010) similarly reported a high level of ownership among the pregnant women attending ANC in Owerri, Imo state. This is in contrast with the low level of ownership reported by Wagbatsoma et al (2010) among pregnant women attending ANC in Etsako west LGA of Edo state.

The rate of use was low among both groups surveyed despite the high level of awareness found at the private hospital. Similar low levels of ITN use by pregnant women were reported by all authors quoted above, despite the high level of awareness and ownership reported by some of them. This low level of ITN use can be attributed to the various reasons the pregnant women gave for not using it, like not believing it works, cannot afford it, no space to hang it, makes them sweat, etc. Other reasons given for not using ITNs ranges from not believing in its efficacy, not needing it, cannot afford it, not convenient, not affordable, to feeling suffocated under it and just hearing about it.

The level of awareness, ownership, use of ITNs and use of malaria preventive tools were found to be significantly different between the pregnant women attending ANC at IGH and the PH, while there was no significant difference in their ages, educational levels, source of information of ITNs and their reasons for not using ITNs.

There is therefore need for intense educational programmes, campaigns and interventions to promote the actual use of ITNs and not just its ownership. This can be done through ante-natal talks, the use of posters, media and health practitioners to improve the rate of ITN use. This has been reported by Ssengonzi et al (2010) that including enhanced malaria prevention education as an integral component of ITN distribution programmes could help promote the use of malaria prevention methods and help stem malaria infections.

Three methods of malaria prevention viz use of window and door nets, use of insecticide sprays and keeping their environment clean were found to be favored above the use of ITNs by the pregnant women.

From the data collected on the malaria preventive methods recommended by pharmacists to pregnant women, it can be seen that almost all the pharmacists recommended the use of insecticide treated nets as a means of protecting the pregnant women from malaria whenever they visited their pharmacies.

Also highly recommended next to insecticide treated nets is the use of intermittent preventive treatment. Probably, because this is one of the recommended tools to Roll back malaria, it has been highly publicized alongside the use of insecticide treated nets. The use of Window and Door nets, and environmental cleanliness were also widely recommended. Until recently, these last two tools were the most recommended and most used by pregnant women in Nigeria and their households for the prevention of malaria, but they are now being overtaken by the use of insecticide treated nets and intermittent preventive medicine from the results obtained and as advocated by WHO 2002b.

In a country such as Nigeria which can be described as not too clean, keeping the environment clean, especially free of stagnant pools of water which can breed mosquitoes is definitely recommended, and if this method can be combined with a high rate of ITN use, a lot will definitely be achieved in the prevention of malaria infection.

Of all the methods recommended by pharmacists to pregnant women as a malaria preventive tool, insecticide treated nets were the most always recommended tool. It remains to be seen what impact these recommendations achieve as will be reflected by the rate of use of this tool by pregnant women. There is need to however de-emphasize the practice of recommending and use of the more harmful methods such as mosquito coils and insecticide sprays as these contain harmful substances which can be harmful to humans if used excessively.

CONCLUSION

Majority of pregnant women in this local government area are aware of insecticide treated nets as a malaria preventive tool, but many of them don't own an ITN or use it yet. This has negated the high level of awareness which should have culminated in high ownership and use of ITNs by these pregnant women. Also, most

pharmacists recommend the use of insecticide treated nets as a malaria preventive tool for pregnant women, and they also give them adequate information on the treatment and use of these nets.

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