Original Article

Awareness and use of Insecticide Treated Nets among women attending ante-natal clinic in a Northern state of Nigeria

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Abstract

Objective: To determine the awareness, accessibility and use of ITN by pregnant women attending ante-natal clinic (ANC) at the Primary Health Care (PHC) level considering the Government commitment of ensuring that at least 60% of pregnant women benefit from ITN by year 2010.

Methods: This descriptive cross sectional study was carried out in all 78 PHC centres in the state. Four hundred and fifty-five (455) pregnant women that consented to the study where interviewed during their ANC sessions using semi-structured questionnaires. Data entry and analysis was done on a micro computer; frequency tables and cross tabulations of important variables were done; and Chi-square test was used for the test of significance.

Results: About one-third 164 (36%) of the respondents were aware of ITN in malaria prevention, but less than a third 124 (27%) had ever used it and only 88(19%) were currently using it, while 104 (23%) of the total respondents had a member of their household using ITN. Some of the difficulties encountered or experienced by respondents currently using ITN were scarcity of new nets, difficulty in getting chemicals for re-treatment of nets, non availability of quality ITN for sale. Three hundred and thirty-one (73%) respondents have never used ITN before because of lack of awareness 136(41%), price of ITN is too costly 26(8%) and non-availability of ITN for purchase 67(20%). Respondents' age, educational level, parity and source of information or awareness on ITN have no significant influence on ITN use. ($P > 0.05$); however, the frequency of malaria attack among respondents using ITN was lower than those not using it and this was significant ($P > 0.0043$).

Conclusion: Awareness and utilization of ITN among pregnant women and their household members is still low despite Government policy of free ITN for vulnerable groups and subsidized nets for other people. There is need to focus on creating demand for ITNs through all available health information channels including social marketing. (JPMA 59:354; 2009).

Introduction

The vast majority of malaria deaths occur in Africa, where malaria also presents major obstacles to social and economic development. Malaria has been estimated to cost Africa more than US$ 12 billion every year in lost Gross Domestic Produce (GDP), even though it could be controlled for a fraction of that sum.[1-3] There are at least 300 million acute cases of malaria each year globally, resulting in more than a million deaths. About 90% of these deaths occur in Africa and mostly in young children.[1-3] Malaria is Africa's leading cause of under-five mortality and constitutes 10% of the continent's overall disease burden. It accounts for 40% of public health expenditure, 30 - 50% of in-patient admissions, and up to 50% of outpatient visits in areas with high malaria transmission like Nigeria.[3,4]

In Nigeria malaria has remained a major contributor to high morbidity and mortality accounting for 25% of infant and 30% childhood mortality and it is associated with 11% maternal mortality.[5,6] It is estimated that 50% of the population have at least one episode of malaria each year.[6,7] With a total population of 120 million, this translates to 60 million people suffering from attacks of malaria yearly. It is estimated that children under the age of 5 years have 2 to 4 attacks every year, while the prevalence rate among pregnant women is 47.6%.[7] This makes malaria the most important cause of death and disability in children under five in the country. Among pregnant women, malaria is responsible for more than one in ten deaths and accounts for a considerable population of Low Birth Weight babies (LBW) born to these mothers. These babies are too small for their age and are usually at a higher risk of dying from infant and childhood diseases.

African countries with stable malaria transmission, infection during pregnancy is estimated to cause as many as 10,000 maternal deaths each year, 8 - 14% of all low birth weight babies and 3 - 8% of all infants' deaths.[3,7] Despite the high impact of malaria on maternal and child health, the problem of malaria has long been neglected such that less than 5% of pregnant women have access to effective intervention. One of the major breakthroughs of recent years is the realization that mosquito nets treated with insecticide give a much higher degree of protection against malaria. When properly used, Insecticide Treated Nets (ITNs) can reduce malaria transmission by at least 60% and child deaths by

20%.[1-3,7]

In the last few years malaria has become international and domestic priority. African countries have allocated over 80million US dollars for malaria control with a commitment to implement strategies agreed by the Roll Back Malaria (RBM) partners.[1-3,7] The global commitment of RBM is to halve malaria disease and associated death by 2010; and this target was re-affirmed by leaders of 44 African nations who met in Abuja, Nigeria in April 2000. The specific targets of malaria control under the RBM initiative are: at least 60% of people at risk of malaria, (especially young children and pregnant women) benefit from ITN and minimum of 60% of pregnant women would have access to effective preventive treatment.[2,3] As at 2003, about 15% of children and 10% of women sleep under any net and less than 5% of Africa's children sleep under ITNs.[7] It is therefore obvious that attainment of the RBM set targets would require extra effort. In response to this, many African countries including Nigeria are providing free ITN to children and pregnant women and subsidizing the cost of ITN for other people.

In Nigeria there are on-going efforts to bring prices of ITN down by encouraging local production and reduction of taxes and tariffs on ITN. This study was conducted to determine the awareness, accessibility and use of ITN by pregnant women who constitute a fairly large vulnerable group for malaria; and who as mothers, also play a major role in the prevention of infant and childhood morbidity and mortality resulting from malaria infection.

Methodology

This descriptive cross sectional study was carried out between March and October 2006 in Kwara; a state in the North Central region of Nigeria. The study focused on pregnant women attending antenatal clinics (ANC) at Primary Health Care (PHC) centres in all the 16 Local Government Areas (LGAs) of the state and 6 (37%) of these LGAs are rural communities. The National health policy of Nigeria recognized PHC centres as the first level of contact of individual and family with the country's health care delivery system; and the services at this level include promotive, preventive, and curative care. The National strategy of free ITN distribution to pregnant mothers and children is based on existing structures of PHC which provide care and services to over 65% of the country's population, majority of whom live in rural areas where the burden of malaria is highest. There are 78 PHC centres providing ANC in the state and the frequency of the service ranged between 1 - 3 sessions per week. However, majority of the centres offer ANC services once a week.

With the support and assistance of the Director of PHC at the State Ministry of Health, all the PHC centres were informed of the research and dates of visits to each of the centres were communicated to the staff through the Officer-in-Charge of each centres. All the PHC centres were visited on the agreed dates when ANC services were in progress. Verbal informed consent was sought from each pregnant woman seen on the day of the visit. Those that consented were interviewed using semi-structured pre-tested questionnaires that contained questions that elicited information on the awareness, use and acceptability of ITN by the respondents.

In all 512 pregnant women were seen during the visits but only 455 consented to participate in the study. Data entry and analysis was done using EPI 2000 software package on a micro computer. Frequency tables were generated and cross tabulations of important variables were done. Chi-square test was used to determine the statistical significance of important observations and differences seen in the cross tabulated variables. Level of significance was pre-determined at p-value less than 0.05.

Results

Out of the 512 pregnant women approached for the study, only 455 consented to be interviewed giving a participatory rate of 89%. The age of the respondents ranged from 16 to 44 years with a mean of 27 ± 6.7years. Most of the women were married 413 (90.8%), while 42 (9.2%) were still single. Although, more than half of the respondents 281(61.8%) were house-wives,139 (30.7%) were gainfully employed while 35 (7.5%) were students / apprentice.

The methods of malaria prevention practiced by the respondents household were environmental sanitation 252 (55%), netting of doors / windows in homes 201 (44%), use of insecticide spray/coil 188(41%) and regular use of prophylactic drugs 59 (13%) while only 121 (27%) of the respondents mentioned use of ITN as a preventive method for malaria. About one-third 164 (36%) of the subjects were aware of ITN in malaria prevention, less than a third 124 (27%) had ever used ITN and only 88 (19%) were currently using ITN; less than a quarter 104 (23%) of the total respondents had a member of their household using ITN.

Out of the 88 subjects currently using ITN, 32 (36%) had used it for 7 - 9 months, while few 8 (9%) have used it for well over 12 months. Some of the difficulties encountered or experienced by respondents currently using ITN included: scarcity of new nets, difficulty in getting chemicals for re-treatment of nets, non availability of quality ITN for sale and feeling of excessive heat when under ITN cover (Table 1). The 36 respondents who had previously used ITN but stopped using it gave reasons like feeling uncomfortable under ITN cover 9 (25%), inability to re-treat expired net 11 (30%) and non availability of new nets to replace the old ITN after wear and tear resulting from long time use 6 (17%). Three hundred and thirty-one (73%) subjects had never used ITN before due

Table 1: Duration of ITN use and reasons for discontinuing its use.

Duration of ITN use among current Users	Frequency (%)
< 4months	13(15%)
4 – 6 months	18(21%)
7 – 9 months	32(36%)
10 – 12 months	17(19%)
> 12 months	8(9%)
Total	88(100.0%)
Difficulties experienced by current Users of ITN (multiple response N=88)	**Frequency (%)**
Scarcity of new ITN	17(19%)
Lack of chemicals to re-treat ITN	24(27%)
Experienced excessive heat under ITN cover	38(43%)
Available ITNs are of poor quality	12(14%)
ITN harbours dust	19(22%)
Most ITN are fragile and tear easily	9(10%)
Expired ITN are on sale	7(8%)
Reasons for stopping ITN use among ever used	**Frequency (%)**
Feel uncomfortable under ITN cover	9(25%)
Problem of re-treatment of expired ITN	11(30%)
No replacement for torn or worn out ITN	6(17%)
Feel hot under ITN	5(14%)
No specific reason	5(14%)
Total	36(100.0%)
Reasons for not using ITN (multiple response N=331)	**Frequency (%)**
ITN is too expensive	26(8%)
Not aware of ITN	136(41%)
ITN not available for purchase	67(20%)
Believed ITN is ineffective	20(6%)
Don't know where to purchase or get ITN	56(17%)
Thinks it is not comfortable to use	47(14%)
No specific reason	23(7%)

to lack of awareness 136 (41%), ITN too expensive to buy 26 (8%), non availability of ITN for purchase 67 (20%) and belief that it is not effective 20(6%) Table 1. All the respondents confirmed to have had a malaria attack within the past 12 months and the components of treatment given included one or more of the following: drug treatment 414 (91%), advised bed rest 224 (49%), counseled to use ITN 33 (7%) or insecticides spray / coil at home 77 (17%). The cost incurred in the treatment of an episode of malaria attack was an average cost of 20US dollars (Table 2).

The respondents' age, educational level, parity and source of information or awareness on ITN have no significant influence on ITN use among the respondents ($P > 0.05$). Also, a greater proportion of the respondents who used ITN had at least one household member using ITN as against their counterpart who did not use ITN. However, this is not statistically significant ($P = 0.0965$). The frequency of malaria attack among subjects using ITN was lower than those not using it and this was significant ($P > 0.0043$). There was no significant difference in the frequency of malaria attack among household member using ITN and those who do not ($P = 0.463$) Table 3.

Discussion

The current death rates from malaria in Africa are undoubtedly decreasing because of improvement in health services and living standards, despite this malaria remain one of the most widespread disease and severe in the developing world. About 102 countries in the world are considered endemic and half of which are in Sub- Sahara Africa. More than 2.4 billion of the world population is at risk of malaria.[8,9] Control of malaria requires good knowledge and awareness of appropriate preventive measures among the general public to ensure positive health behavior and health seeking habit. In this study the respondents' knowledge on malaria prevention was satisfactory considering that majority knew that environmental sanitation, use of window nets and use of insecticide spray can prevent malaria infection.

However, their knowledge on specific measures like use of ITN was low because less than a third mentioned ITN as a useful method in malaria prevention despite the ongoing public awareness campaign on ITN. This also reflected in the few numbers of respondents and / or their household members who had ever or are currently using ITN. This finding is similar to what was reported in a Demographic Health Survey (DHS) carried out in Ghana where 18% of the households had mosquito nets but only 3% these households actually have ITN. The Ghana DHS also reported that 15% of children under five years and 10% of women of reproductive age currently sleep under a mosquito net. Out of this 3.5% of

Table 2: Components of malaria treatment received by respondents and household member using ITN.

Components of malaria treatment (Multiple response N= 455)	Frequency (%)
Medication (drug & injections)	414(91%)
Advice for bed rest	224(49%)
Counseled to use ITN	33(7%)
Counseled to use insecticides at home	77(17%)
Advised on environmental sanitation at home	83(18%)
Dietary advice	24(5%)
Cost of malaria treatment (US dollars)	**Frequency (%)**
Nil	65(14%)
<5 dollars	121(27%)
5 – 10 dollars	143(31%)
> 10 dollars	126(28%)
Total	455(100%)
Household member using ITN (Multiple response N=104)	**Frequency (%)**
Children	23(22%)
Husband	16(15.4%)
In- Laws	11(10.6%)
Others	21(20.2%)

Table 3: Comparison of ITN use by respondents and their household in relation to episode of malaria attack reported.

Use of ITN by household member	Use of ITN by respondents YES	NO	Total
YES	26	78	104
NO	62	289	351
TOTAL	88	367	455
Chi square = 2.76	**df= 1**	**P = 0.0965**	

Last malaria attack among respondents in relation to use of ITN by respondents.

Last malaria attacks (months)	Use of ITN by respondents YES	NO	Total
< 1	8	100	108
1- 2	23	90	113
3 -4	27	99	126
5 -6	17	47	64
> 6	13	31	44
TOTAL	88	367	455
Chi square = 15.36	**df= 4**	**P = 0.0043**	

Use of ITN by household member in relation to last malaria attack in the household.

Last malaria attacks (months)	Use of ITN by household member YES	NO	Total
< 1	11	34	45
1- 2	15	62	77
3 -4	20	90	110
5-6	24	76	100
>6	34	89	123
TOTAL	104	351	455
Chi square = 3.6	**df= 4**	**P = 0.4633**	

children under 5 and 2.2% of women of reproductive age respectively slept under ITN.[10]

ITNs have widely been tested in the control of malaria and have shown a great potential in reducing both morbidity and mortality due to malaria.[11] However, many people still do not own or use it. Studies have shown that several factors affect ownership and use of ITNs. Cost has been implicated as one of the major reasons for non-ownership of nets even though cost of ITN is not the only factor that hinders ownership and use of nets.[12,13] Other important factors that affect ownership and / or use of ITN included size and type of the house, available sleeping facilities and sleeping arrangements especially in large family and other competing needs of the individual, family and the communities.[12-15] Sleeping space and sleeping patterns also determine whether it would be possible to hang and use a net. When the house is too small, it may not be feasible to use a net. Houses in most rural communities are usually old and small in size with high room temperatures at night so that people avoid sleeping under ITN due to unbearable heat. Sometimes the intense heat in some rural homes make some household members to opt for sleeping outside the house thus making it rather difficult to use bed nets.[16,17]

Another obvious finding in this study is the stoppage of ITN use by some respondents who had previously used it. Similar findings have been documented in other studies. Reasons for non use or cessation in ITN use in this study varied among the respondents and included: scarcity of ITN to buy, lack of awareness and problem of re-treatment of expired nets. This is consistent with reasons and explanations reported in other studies where non-availability of ITN, lack of awareness and knowledge of where it can be purchased and problem of affordability were major factors that affect stoppage and / or non-use of ITN.[18-21] Household economic status has been related to net ownership in a number of studies.[18,19] As a result of the economic crisis and reforms in the last 5 years in Nigeria, many people especially the rural population are living in extreme poverty.[6,7] This makes people not to value the need for ITN due to competing essential domestic needs like food. In central Malaita in Solomon Islands, it was reported that factors affecting ITN ownership and continuous use were: ITN cost, community expectation of free bed nets and season of the year. The report also revealed that 68% of the respondents would not use a net during hot weather.[22]

A number of initiatives to promote ITN through appropriate social marketing techniques are required to address low ITN usage and ownership. In Nigeria, the promotion of the ITNs started as a pilot project in Nsukka in 1992 which later extended to other states in 1999.[23,24] The project confirmed that when properly used, ITNs can reduce rate of disease transmission and subsequent infant and child mortality. Promotion Awareness Campaign (IMPAC) was then introduced as a strategy for scaling up the use of ITNs targeting the vulnerable groups (children under five years and pregnant women). The campaign encouraged ITNs distribution as a reward or incentive for completion of immunization by children under five years and the attendance of antenatal clinics by pregnant women. IMPAC helped to increase coverage for ITN distribution and also encourages the patronization of health facilities, improve immunization coverage and at the same time act as an awareness creation tool regarding the need to protect oneself against malaria.[23,24]

Studies in other African countries like Kenya, Ghana and Tanzania indicated that household members are willing to pay for ITNs, but typically less than the current cost.[7,10,20,25] One approach to reducing price is to subsidize the cost of ITNs to a level that poor people can afford it; otherwise this powerful public health tool will have a limited impact in malaria control.

Episodes of malaria attack among the respondents and

their household not using ITN was higher than those using ITN. The impact of ITN use on maternal and child health as it relates to malaria have been reported earlier.[3,7,16] In Nigeria, there is an average of one attack of malaria per household in a month, and the average expenditure for the treatment was estimated to cost more than 4 dollars.[1,7] This represents a substantial part of household income among the low socio-economic class which constitutes over 65% of the population. In Ghana, the cost of malaria care was reported to be 34% of the income of poor household and only one percent (1%) of the income of the medium / rich households.[7,10] Although, there is little evidence to support relationship between socio-economic status and malaria incidence, there is mounting reports that poor households are more vulnerable to the consequences of malaria infection, which can be prevented by simply using ITN.

Conclusion

Awareness and utilization of ITN among pregnant women is still low despite Government policy of free ITN for vulnerable groups. There is need to provide enabling environments for scaling-up actions that would make ITN accessible, affordable and user friendly to people of low socioeconomic class.

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