Journal of Pharmaceutical Research Vol. 8, No. 1, January 2009 : 42-44.

EVALUATION OF EFFECTIVENESS OF MOSQUITOE-TREATED BED NETS AMONG MOTHERS ATTENDING ANTENATAL CLINIC IN A CHRISTIAN HOSPITAL IN NSUKKA AREA OF ENUGU, STATE IN NIGERIA

Momoh MA*[1] and Usman M[2]

[1]Department of Pharmaceutics, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka - 410001, Nigeria.

[2]Department of Chemistry, Faculty of Sciences, Ahmadu Bello University, Zaria, Nigeria.

Received on : 09.07.2008 Revised : 11.01.09 Accepted : 29.01.09

ABSTRACT

Malaria is a public health problem in more than 90 countries inhabited by approximately 2400 million people, representing about 40% of the population of the world. Malaria has caused a lot health problem in the word, Africa taken the leads. It has defied many solutions especially drugs and other medical treatment. The obvious plan is to prevent the attack, as prevention is better than cure. Hence this study is to evaluate the effectiveness of pyrethroid insecticides treated mosquito bed nets in malaria prevention. A total of 2500 clients were studied. About 20 % of the study sample rejected the bed net, 65% accepted to use consistently while 15% agreed to use it occasionally. About 35% clients that suffered malaria were among the 500 clients that refused the bed nets. Out of the 70 % (1,635) of the population that used it consistently for a period of 8-12 months, only 1-2% suffered malaria. Many (35%) found the re-treatment very difficult, while some believed that, the bed net is not effective. The study shows that, the treated bed nets could prevent malaria when consistently used.

Key words: *Evaluation; treated- bednets effectiveness; mosquitoes.*

INTRODUCTION

Malaria is a public health problem in more than 90 countries inhabited by approximately 2400 million people, representing about 40% of the population of the world. Best estimates currently describe the annual global burden of malaria as: deaths 1.12 million; clinical cases 300–500 million and disability-adjusted life years (DALYs) 42.28 million. It has been estimated that the economic burden of malaria is also extremely high, accounting for a reduction of 1.3% in the annual economic growth rate of countries in which malaria is endemic, and that the consequent long-term impact is a reduction of gross national product (GNP) of more than half [1].

Malaria is not a uniform disease, it has many manifestations and its impact varies depending on the epidemiological setting. More than 90% of the burden of disease falls in sub-Saharan Africa, and almost all deaths attributable to P. falciparum occur in Africa[2] . Most of the remaining burden is distributed between the Indian subcontinent, south-east Asia, Oceania, and the Americas. After P. falciparum, the second largest burden of disease is caused by P. vivax, which may cause up to 80 million cases of malaria per year, of which approximately 15% occur in Africa and 85% outside Africa. The burden of malaria differs according to age and sex. Almost all deaths occur in children aged < 5 years in Africa. Although, the risk to older children and adults in Africa is reduced due to development of a degree of immunity to the disease as a result of continuous exposure, outside Africa, where continuous exposure does not occur, the burden of disease extends into adulthood. Pregnant women, especially primigravidae in Africa, are at high risk, and are the major risk group of adults in Africa. The disease burden associated with pregnancy has an additional impact due to the effect of malaria on the health of the foetus[3]. There is a strong social and economic dimension to the burden of this disease. Those at greatest risks of malaria are populations that are poor, or that are marginalized, such as ethnic minorities and people displaced as a result of civil unrest [4].

Major trends over the last few decades suggest that the situation will worsen if effective action is not taken. These trends include an increase in epidemics of malaria; upward trends in mortality over the last three decades including in sub-Saharan Africa; an upward trend in the incidence of malaria caused by drug-resistant P. falciparum; the re-emergence of malaria caused by P. vivax in areas from which it had been previously eradicated, e.g. in the Caucuses and central Asia; and an increase in imported malaria in the developed world. In view of rising trends in the burden of malaria and the difficulties encountered in control of this disease, a review of research and control activities and future plans is urgently required.

***Correspondence :** jointmomoh@yahoo.com

In recent years, and especially for low-income countries in Africa and south-east Asia, the treatment of bednets with pyrethroid insecticides has proved feasible and effective. Treatment with pyrethroids improves the personal protection given by bednets against late-night biting mosquitoes and, when used throughout a community, these insecticide-treated nets (ITNs) can reduce the infective biting population of mosquitoes. More data are required on the relative contribution of the personal and community elements of the protective effect, which is important for the design of intervention strategies. There has been concern that the use of only pyrethroids for the treatment of bednets exposes this method to the risk of evolution of resistance to pyrethroids among the vectors[5]. However, some data from West Africa indicate that treated bednets are effective even in the presence of a high frequency of a gene conferring resistance[6]. This needs further study. There remain some gaps in knowledge of the epidemiological protection given by bednets. Most of the bednets currently used in Africa are untreated, and too little is known about the degree of protection they provide against malaria[7]. More information is needed about the epidemiological significance of entomological measures of the persistence of insecticides on nets. Most epidemiological studies of field trials of treated bednets have been operated on the basis of free distribution and treatment[8]. There are different opinions as to whether such methods could be scaled up to the national and regional level, or whether it would be necessary to rely on subsidies targeted at especially vulnerable groups, and complemented by the private sector.

Nigeria is a highly vulnerable country for malaria parasite, where 80 % of child death and about 10 % of adult deaths are attributed to malaria. These are due to our geographical location, poor sanitations and fraudulent attitude where most bed nets in our market are far from treated, all these enhances malaria prevalence[9]. Hence this research is aim at finding the effectiveness of the treated bednet in malaria prevention.

METHOD

Data collection

The target populations were women attending antenatal clinic at Bishop Shanahan Hospital, Nsukka and local government area of Enugu State. The design adopted for this study is the descriptive sample survey in which only a sample of the population was used for the study and findings from the sample generalized to the rest of the population in the zone.

Study participants were given the questionnaire to elicit response from the sample. To ensure validity of the contents, midwifery experts were allowed to moderate the questions and items less than 95 % acceptance were rejected. The Samples chosen were 2500 women out off 3500 mothers that received treated mosquito bed nets free. They were randomly selected for the study.

Data analysis

A statistical method of analysis based on chi-square was used. Based on the data collected, hypotheses were formulated and tested at 95% level of significance. The data were also expressed using percentages.

RESULTS AND DISCUSSION

A total of 2500 women in ANCs out of 3500 that received treated bed net were enrolled for this study about (71.3%) of the entire population that received the treated bed nets. There were no notable parameter for the selection or difference between the enrolled and none enrolled women.

Characteristics of the enrolled women:

The majority of the women were married, only a handful of them were social mother, only few were gainfully employed, this equally affects the wellbeing (Table 1). The majority of the women before the initiation of bed net had malaria although treated according the WHO standard, many of them used the common bed net in the market that were not treated as such did not prevent malaria attack (not documented).

Table 1: *Characteristics of women enrolled in study of the effectiveness of mosquitoes treated bednets, in Nsukka LGA and Enugu State.*

Characteristics	% Women from ANCs (n=2500)	No. of subjects
Age (yr),	15-46 yr (100%)	2500
Attend any form of education	75%	1875
Able to read	80%	2000
Married	98%	2450
Gainfully employed	64%	1600
Frequency on the use of bednets		
Use bednet all the time	65%	1625
Use occasionally	15%	375
I don't like bednets because		
Bednets does not prevent malaria	20%	500
Treatment of bednet a is big problem	15%	375
The chemical is harmful	35%	875
Gestational age when start ANC visit		
2 – 4 months	60%	1500
5 – 9 months	40%	1000

A total of 20 % (500) rejected the uses of the treated bed net while 70 % about (1,625) used the treated bed net. From the reported date the, clients registered at the ANCs clinic, it could be deduced that on an average, 59 % out of the 70 % that used the bed net, used it for a period 7 months, while less than 10 % used it for a year (Table 2). Only 2 % out of the 1,625 clients that used the bed nets frequently suffered from malaria as compared to 35 % out of 500 clients that refused the bed net suffer malaria on monthly or alternate month basis as shown in (Table 2). This is an indication that treated mosquito bed nets was very effective in malaria prevention.

The frequency of malaria attacked especially every month is about 20%, out of this none (0%) was found

in those that used the net correctly while the entire 20% score was for the group that they refused the net. On those that suffered malaria on alternate month, they were 33% and only 1% was found in the group that used the treated bed nets and 32% was for the none user of the treated bed nets see (Table 2).

Table 2: *Rates of reported fever, malaria among the women participants*

Characteristics	% reported	% used bednet	% not used bednet or used occasionally
Malaria before using Bed nets or visit ANC	70 %	0	0
Fever within the weeks before using Bed net	72 %	0	0
Fever after using bed net	39%	6%	33%
Self reported malaria after initiate bed net	35 %	2%	33%
Frequency of malaria attack			
Every month	20%	none	20%
Every alternate months	33 %	1%	32%

Previous researched has demonstrated that insecticide-treated bed nets or ITNs can reduce the number of fatal cases of malaria in children by 20%. The effectiveness of the mosquito bed nets is, however, dependent upon how consistently they are used. The bed nets also need to be regularly re-impregnated with insecticide, some of the users that refused to use the bed net at all, gave an excuse of the difficulties involved in the re-treatment of the bed net. Furthermore, the researcher found that people in the area mostly used the mosquito bed nets to keep the mosquitoes at bay. They do not immediately view the bed nets as a means of preventing malaria. Although, there is an increasing awareness that malaria is caused by mosquitoes, many still believe in other causes of malaria such as drinking dirty water or walking in the rain.

Chemical use in the treatment is another hindrance for the uses of the bed nets as 35% about (375) of the population who failed to use the net consistently were due poor knowledge on the chemical use in the treatment of the net (Table 1). Findings revealed that information provided about the use of treated mosquito bed nets must be attuned to the knowledge and habits of the population [10]. For example in Nsukka, the message, 'The use of mosquito bed nets prevents mosquitoes bites" appeared to result in greater mosquitoes bed net use than the message that mosquitoes treated bed nets prevent malaria.

This study has two important limitations. We were unable to continue this research for the whole twelve months due to the seasonal condition of malaria, although malaria is all-round affair but more during rainy season. However the result of this study could still give an insight the attitude of the people in this area toward treated bed net. In addition, the information supplied about the uses of bed net is self-reported. We are not sure whether some of the subjects actually responded sincerely. But the striking thing in the study is that it exposed the general belief about bed net and the extent they know about malaria, this has offered the advantage of solving the likely bed net use hindrance in the area.

CONCLUSION

In conclusion, the provider of the treated bed nets should derive a means of assisting the user to re-treat the net and or provide a long lasting treatment such that re-treatment will not be a hindrance. Sound evidence-based advice is necessary if mosquito bed nets are to be used effectively for malaria prevention, such programme should make use of the religious centres, market place and the community leader on the importance of the bed net to the people in the area.

REFERENCES

1. Thomas DD, *et al*. Science. 2000; 287: 2474.
2. Trape JF and Rogier C. Parasitology Today. 1996; 1: 236.
3. Trape JF. Am J Trop Med Hyg. 2001; 64:12.
4. Udom SR. J Exp Med. 1989; 169:1835.
5. Urban BC, *et al*. Nature. 1999; 400: 73.
6. Uren AG, *et al*. Molecular Cell. 2002; 6: 961.
7. Venter JC, *et al.* Science. 2001; 291: 1304.
8. Winstanley PA. Parasitology Today. 2000; 16: 146.
9. Wernsdorfer WH, *et al*. Acta Tropica, 1994; 56: 143.
10. Dolan G, *et al.* Transactions of the Royal Society for Tropical Medicine and Hygiene. 1993; 90: 487.