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Original article

A Study on the Pattern of Insecticide Impregnated Mosquito Net Use in Malaria High Risk Area of Kamrup District, Assam

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Abstract

Background: Insecticide-treated net (ITNs) is one of the prominent malaria preventive measures. India has been promoting and scaling up the use of ITNs in endemic malarious areas. Very few studies have been conducted in acceptance of ITNs and various practices related to it.

Objectives: To study the use of insecticide impregnated mosquito net in malaria high risk area and to study various practices among the impregnated net users.

Materials and methods: Community based cross sectional study conducted in villages under malaria high risk sub-centres of Rani Community development Block. Information regarding the use of ITNs from 330 randomly selected head of the households was collected in pre-designed and pre-tested schedule.

Results: 73% of the households used ITN. Among the non ITN users, 46% were unaware about ITN/LLN. Only 56% population used ITN/LLN regularly and seasonal prevalence of mosquito is the main reason cited for this. 98% of households washed ITN/LLN in last 6 months. Only 26.2% households washed nets six monthly, 62% dried nets under sun. In 31.5% households all the members slept under ITNs and inadequate supply (92.1%) is the main reason cited for this. A statistically significant relationship between MPW Visit and regular use of ITN was observed ($p<0.001$).

Conclusion: The use of insecticide treated net is not popularized in the study group. Community awareness and preparedness is needed for utilization and proper use of ITN/LLNs.

Key words: Malaria, High Risk Areas, Insecticide Treated Nets (ITN/LLN), Practices.

Introduction:

Malaria is a major public health problem in India accounting for sizeable mortality, morbidity and economic loss. The disease has been known to mankind since the dawn of civilization. During the Ayurvedic period, Charaka and Susruta described the disease elaborately and associated the disease with mosquito bites. The disease has got great impact on social and cultural progress of mankind. Practices adopted by the community of a particular area have got a great impact on the course of the disease as well as its prevention.

Insecticide-treated nets (ITNs) are the most prominent malaria preventive measure for large-scale deployment in highly endemic areas[1]. The National Vector Borne Disease Control Programme (NVBDCP), India has been promoting and scaling up the use of insecticide-treated nets (ITNs) in the tribal dominated malarious areas of north-east India[2]. On the basis of vector behaviour, especially the Anopheles dirus complex, and the experimental successes, the use of ITNs was regarded as the suitable and effective intervention measure for malaria control in the north-eastern region of India[3]. Individuals not sleeping under an ITN, but

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living within an area with high ITN coverage, have also been shown to be at decreased risk of infection due to the resulting reduction in overall malaria transmission[4]. A 42% reduction of all mortality in children aged 1 to 59 months after the use of ITNs in Gambia had been observed[5]. The cost-effectiveness of ITNs has also been demonstrated by Goodman[6].

Human behaviour and practices, which are influenced by social, cultural, economic and political factors, can affect health promotion and disease prevention activities. There are various activities that can be done at family and community levels to contain the menace of malaria. These include activities related to elimination of mosquito breeding, early diagnosis and treatment as well as acceptance and utilization of anti-malarial services. Prevention of malaria through better knowledge and awareness is the appropriate way to keep disease away. Confusion regarding the illness, treatment-seeking behavior and utilization of services may enhance or interfere with the effectiveness of control measures.

In spite of control programmes in operation for nearly five decades, malaria situation is not improving much. With effective drugs and anti-insect measures available, we have not been able to totally get rid of the disease. Some factors like behaviour and practices of the community towards malaria may act as important determinants for the situation. Impregnated bed nets have been identified as one of the major practices related to the prevention of malaria. Limited studies are available in this regard from the high risk areas. Hence the present study is conducted with the following objectives:

1. To Study the Use of Insecticide Impregnated Mosquito Net in Malaria High Risk Area of Kamrup District, Assam
2. To study the various practices among the impregnated net users.

Materials and Methods:

The study is a community based cross-sectional study carried out in the Rani Community Development Block, Kamrup District, Assam which is a field practice area of Department of Community Medicine, Gauhati Medical College and was conducted between August 2011 to July 2012. There were five high risk sub-centres for the year of 2010 and under these sub-centres there were 35 villages. All the 35 villages under these sub-centres were included for the study. The total population of these villages was 13,750 with a total of 2750 households. Considering the feasibility and convenience, 12% of households were selected from each village randomly. Thus, a total of 330 households were selected for the study. Enquiries related to use of impregnated nets were made for last one year. Impregnated nets include Insecticide treated nets (ITN) and Long Lasting Insecticide treated net (LLN). The respondents were the head of the households; however in his/her absence an adult responsible family member was interviewed. For determining socioeconomic status of the households, Modified Kuppuswamy Scale was used.

Data collected in pre-designed, pre-tested schedule and semi-structured schedule and by observational and interview method. The collected data were compiled, tabulated and subjected to statistical analysis in SPSS software version 17.0.

Results:

Table 1 depicts the socio-demographic characteristics of the study population. The majority (70%) of the population is tribal. Male (89.1%) contributed the majority among the respondents. Education above high school level was seen to be lower amongst the

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respondents. Majority of the households belonged to Upper-lower and Lower socioeconomic class.

All the studied households used mosquito nets either ordinary or impregnated nets and only 27% households used non insecticide treated net during last year (Table 2).

Table 3 shows that majority of respondents were unaware about the benefits of ITN/LLNs.

Among the ITN/LLN users, only 56% were found to be using ITN/LLN regularly (Table 4). Majority of the respondents did not use ITN/LLN due to their perception of seasonal prevalence of mosquitoes (Table5).

Table 6 depicts few practices regarding the use of ITN/LLN. Majority (98%) of households washed ITN/LLN during last 6 months and only 26.2% households washed six monthly. Only 38% households dried ITN/LLN under shade. In 31.5% households, impregnated nets were used by all the family members. Inadequate supply of impregnated nets (92.1%) and financial constraints (73.3%) were the main reasons for not using impregnated mosquito nets by all the family members of the interviewed households.

A statistical association was found between MPW Visit during last year and regular use of Insecticide Treated Nets (Table 7).

Table 1. Socio demographic profile of the study group:

Variables	**Frequency**	**Percentage**
Age Group		
18-30	37	11.2
31-40	94	28.5
41-50	98	29.7
51-60	59	17.9
>60	42	12.7
Sex		
Male	294	89.1
Female	36	10.9
Religion		
Hinduism	280	84.8
Islam	28	8.5
Christianity	22	6.7
Caste		
ST	232	70.3
General	48	14.5
OBC	29	8.8
SC	21	6.4
Literacy		
Illiterate	114	34.5
Primary school	77	23.3
High school	99	30

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High school passed	23	7
Higher secondary passed	9	2.7
Graduate and above	8	2.4
Occupation		
Daily wage earner	117	35.5
Cultivator	107	32.4
Business	50	15.2
Service	35	10.6
Skilled labour	16	4.8
House maker	5	1.5
Socio-economic Class		
Upper class (I)	6	1.8
Upper middle (II)	22	6.7
Lower middle (III)	26	7.9
Upper lower (IV)	152	46.1
Lower (V)	124	37.6

Table 2. **Distribution of respondents according to type of mosquito net use:**

Type of mosquito net	**No.**	**%**
Ordinary net along with ITN/LLN	241	73
Only Ordinary net	89	27
Total	330	100

Table 3. **Distribution of respondents according to reasons cited for not using ITN/LLN:**

Reasons	**No.**	**%**
Not aware about ITN/LLN	41	46
LLN not distributed	33	37.1
ITN camp not held	20	22.5
ITN camp held infrequently	8	9

Total (n=89)

*Multiple responses

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Table 4. **Distribution of respondents according to regular use of Insecticide treated nets (ITN/LLN)**:

Use ITN/LLN regularly	**No.**	**%**
Yes	135	56
No	106	44
Total	241	100

Table 5. **Distribution of respondents according to reasons cited for not using Insecticidal treated nets regularly**:

Reasons	**No.**	**%**
Mosquito absent during some seasons	95	89.6
Fear of adverse effect	15	14.2
Not convinced about benefit	11	10.4
Irritation of skin	2	1.9

Total (n=106) *Multiple responses

Table 6. **Few findings regarding the use of Insecticide Treated Nets (ITN/LLN)**:

Variables	**No. (%)**
Washing of nets during last 6 months	
Yes	236(98)
No	5(2)
Frequency of washing	
Weekly	29(12.3)
Fortnightly	58(24.6)
Monthly	87(36.9)
Six monthly	62(26.2)
Drying of nets after washing	
Under Sun	146(62)
Under Shade	90(38)
ITN/LLN were used by all the family members	
Yes	76 (31.5)
No	165(68.5)
Reasons for not using ITN/LLN by all family members	
Inadequate Supply	152(92.1)

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Cannot buy	121(73.3)
Not convinced about benefit of ITN/LLN	13(7.9)
	(N=165)*multiple response

Table 7. **Relationship between MPW Visit during last year and regular use of Insecticide Treated Nets(ITN/LLN):**

	Regular Use of ITN/LLN			
MPW Visit	**No (%)**	**Yes (%)**	**N/A (%)**	**Total (%)**
Yes	51(48.1)	53(39.3)	20(22.5)	124(62.4)
No	55(51.9)	82(60.7)	69(77.5)	206(62.4)
Total	106(100.0)	135(100.0)	89(100.0)	330(100.0)

x^2 =13.837; df=2 ; p < 0.001

Note: N/A=Not applicable includes respondents who did not use either ITN or LLN.

Limitations of the Study:

The data collected is based on recall method .Thus forgetfulness of the study population may fail to give the accurate information. However sincere efforts were made to collect as much information possible regarding the requirement of the study.

Discussion:

The present study was conducted in malaria high risk area to see the practices related to bed net use. The study population is mainly tribal and literacy rate was seen to be low among them. The study population comprised of mainly daily wage earner followed by cultivators. Lower socioeconomic status and lower education could be the reason for high malarial prevalence in the study area. Literacy status has been seen to be significantly associated with the knowledge and practices of the respondents about malaria control ($p<0.05$)[7]. Again, studies showed that poverty is directly or indirectly linked with malaria burden in a community[8] and lower prevalence of use of ITN with lower economic status[9].

The encouraging finding in the present study is the habit of using mosquito net by all the households. Under the NVBDCP, nets are provided or impregnated with insecticides in high risk areas. Only 73% households used ITN/LLN and out of them only 56% used it regularly. Low prevalence of use of ITN/LLN is in conformity with other studies done across the world[10,11,12]. The importance of insecticide treated bed nets in prevention of malaria is needed to be looked seriously.

The community is not aware about the benefits of insecticide treated nets as seen in case of 46% households. This requires an urgent attention as community awareness is crucial in promoting the positive attitude towards the utilization of health services. Under the program ITN camps should be frequently held, however, irregular holding of camps has been reported as a cause for not using ITN.

Irregular use of ITN/LLN due to some conception of the community was highly prevalent in the study population. Seasonal prevalence of mosquito, fear of

adverse affects or unconvinced about the benefits of impregnated nets were the major causes for not using ITN/LLNs regularly. Considering the high risk area and behavior of the community about bed net use this strategy can be focused through awareness generation and community preparation. Seasonal preference for using mosquito nets was also mentioned by Prakash A and his co-workers in their study[2].

The adverse practices related to impregnated bed net use like frequent washing and drying under sun was seen to be highly prevalent in the present study. As per the anti-malarial programme guideline, nets should be washed seldom as possible and dried in shade. These habits reduce the effectiveness of the nets and thereby may contribute to higher prevalence of malaria. A definite lack of communication was observed between the service provider and the community. Therefore, targeted efforts have to be made through behaviour change communication to modify the net washing practices of the communities while introducing ITNs in an area. In a study carried out by Prakash A and co-workers, practice of frequent washing of nets was found to be common in Assamese tribal communities[2].

In only 31.5% of the households all the family members were found to be using ITN or LLN. Inadequate supply of LLN, financial constraints and not convinced about the benefits of the impregnated bed nets were the reasons for not using it by all family members. Insufficient supply of insecticide treated nets was also found by Dev V and his co-worker in their study[13].There is a great scope for health education by grass root level workers like ASHA, Multipurpose Worker (MPW) as a significant statistical association was observed between MPW visit and regular use of impregnated mosquito nets.

Conclusion:

Use of impregnated bed net is one of the most effective weapons in preventing malaria. It is evident that the use of insecticide treated net is not popularized in the study group in spite of existing strategy of providing ITN/LLN.

The use of ITN/LLN is long way to go for universal use in this high risk area. The effort of frontline workers in generating community awareness and utilizing them is crucial in this regard. Group meetings and health camps also can be arranged routinely in partnership with community representatives, NGOs and state health functionaries for generating awareness regarding the proper use of ITN/LLN.

References:

1. Schellenberg JA, Minja H, Mponda HL. Re-treatment of mosquito nets with insecticide. Trans R Soc Trop Med Hyg 96: 368-9.
2. Prakash A, Bhattacharyya DR, Mohapatra PK, Goswami BK, Mahanta J. Community practices of using bed nets & acceptance & prospects of scaling up insecticide treated nets in north-east India. Indian J Med Res 2008 Nov;128: 623-9.
3. Dev V. Insecticide-impregnated mosquito nets: an alternative strategy for malaria control. Curr Sci 1998;74: 5.
4. Howard SC, Omumbo J, Nevill C, Some ES, Donnelly CA, Snow RW. Evidence for a mass community effect of insecticide-treated bednets on the incidence of malaria on the Kenyan coast. Trans R Soc Trop Med Hyg 2000;94**:**357-60.
5. Alonso PL, Lindsay SW, Armstrong JRM, Conteh M, Hill AG, David PH, et al. The effect of insecticide-treated bed nets on mortality of Gambian children. Lancet 1991;337(8756):1499–502.

6. Goodman CA, Coleman PG, Mills AJ. Cost-effectiveness of malaria control in sub-Saharan Africa. Lancet 1999;354(9176):378–85.
7. Hanafi AA, Vatandoost H, Oshaghi MA et al. Knowledge, Attitudes and Practices Regarding Malaria Control in An Endemic Area of Southern Iran. Southeast Asian J TropMed PublicHealth 2011;42(3).
8. Malaney P, Spielman A, Sachs J. The malaria gap. Am. J.Trop. Med. Hyg.(Suppl.2) 2004;71:141–6.
9. Hanson K, Kikumbih N, Amstrong-Schellenberg J, Mponda H, Nathan R, Lake S, Mills A, Tanner M & Lengeler C (2003) Cost-effectiveness of social marketing of insecticide-treated nets for malaria control in the United Republic of Tanzania. Bul World Health Organ 81:269-76.
10. Borah PK, Dutta P, Phukan AC & Mahanta J. Health Seeking Behavior Among the Fever Cases During an Outbreak of Malaria in Assam. J. Hum. Ecol 15(3):195-7.
11. Mazigo HD, Obasy E, Mauka W et al. Knowledge, Attitudes, and Practices about Malaria and Its Control in Rural Northwest Tanzania. Malaria Res Treat 2010, Article ID 794261, doi:10.4061/2010/794261.
12. Njama D, Dorsey G, Guwatudde D et al. Urban malaria: primary Caregivers' knowledge, attitudes, practices and predictors of malaria incidence in a cohort of Ugandan children. Trop. Med Int Health 2003;8:685-92.
13. Dev V & Dash AP. Insecticide-Treated Nets, the Key Element for Rolling Back Malaria in North-Eastern India: Policy and Practice. Open Entomol J 2008;2:14-20.