MODERN MEDICINE AND INDIGENOUS HEALTH BELIEFS: MALARIA CONTROL ALONGSIDE *"SADSANA-PHEE"* (ANIMIST BELIEF SYSTEM) IN LAO PDR

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Abstract. The major religion in Lao PDR is Buddhism, but many ethnic groups in rural Lao PDR hold an animist belief system called "*Sadsana-pee*". At the same time, the Bourapar District study site in Khammouane Province, Lao PDR is at high risk of malaria infection. Due to their belief in traditional ways of healing, the promotion of malaria prevention and treatment with modern medicine was not always welcomed by the villagers. Based on the results of question-naire interviews with 240 heads of households from February to March of 2003, the effect of local beliefs on malaria control activities was discussed. Despite widely available western medicine and widely conducted health education, some people still believe that evil spirits cause malaria and rely on traditional medicine and/or religious ceremonies for treatment. Based on our findings, we recommend that future education and malaria control programs be revised and made sensitive to those people holding indigenous beliefs.

INTRODUCTION

People, especially those living in rural areas of developing countries, often hold indigenous health beliefs. We have started malaria research focusing on residential knowledge and behavior in a remote area at high risk of malaria infection in Khammouane Province, Lao PDR in 2002. Malaria control activities there, which involved the promotion of malaria prevention and treatment with modern (western) medicine, were not always welcomed by the villagers due to their beliefs in indigenous healing methods. For malaria control programs to be successful and sustainable, gaining community involvement is a ne-

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Tel: +81-3-5841-3688; Fax: +81-3-5841-3637 E-mail: ckuroiw@m.u-tokyo.ac.jp cessity (World Health Organization, 1987). This requires understanding local health beliefs and the residents' Knowledge, Attitudes and Practices (KAP) related to malaria (Klein *et al*, 1995).

Lao PDR is one of the least developed countries of Southeast Asia, with a GDP per capita of US\$1,900 in 2004 (Central Intelligence Agency, 2004). The country has 5.2 million people in its 240,000 km² of land. Approximately 60 to 65% of the population, most of whom are Lao Lum (people of the lowlands), follow Buddhism (The Bureau of Democracy, Human Rights, and Labor, 2002). About 30% of the population, on the other hand, hold an animist belief system called *"Sadsana-phee"*. These people are found among the minority tribes of the Lao Tum (people of the mountainous areas) and the Lao Soung (people of the highlands).

Malaria causes serious health damages to the people in the country. It accounted for

about half of all deaths in 1996 (Ministry of Health, 1996), and 4.6% of the total population was hospitalized for malaria treatment in 2001 (Ministry of Health, 2001). Our study site, Khammouane Province, is at high risk of malaria infection.

Japan International Cooperation Agency (JICA) began a malaria control project by providing Insecticide-Treated Nets (ITNs) and community malaria education in 1999 (Kobayashi et al, 2004). We implemented the preliminary survey on the progress of malaria control in Bourapar District, Khammouan Province in 2002, and found evidence of general misconceptions and lack of knowledge with respect to malaria among residents; although malaria education was widely conducted, few patients came to the hospital for the treatment of malaria: no one came to free malaria diagnosis/treatment service in villages on the appointed day; few villagers brought their bed nets to dip in insecticide fluid; and some people preferred traditional ways of healing (taking non-western medicines and/ or healing ceremony). The difficulty of gaining community involvement, despite the emphasis placed by the WHO (1987), was also observed in the project site. We therefore hypothesized that despite having received information regarding modern malaria control, the villagers in the study area generally act based on their indigenous health beliefs.

Uza *et al* (2002), through the use of KAP surveys done in 1999 and 2000 among the residents in Khammouan Province, noted the important influence of local knowledge on malaria education. However, they did not explore the influence of indigenous religious beliefs and traditional ways of healing. Our study, therefore, was designed to investigate the community-embedded knowledge of malaria using open-ended KAP questionnaires in which respondents may answer freely and without bias.

The objective of this study is to under-

stand indigenous health beliefs among residents and how those beliefs have affected malaria control activities.

MATERIALS AND METHODS

A community-based, cross-sectional survey was conducted in Bourapar District, Khammouane Province from February to March of 2003, after ethical approval was obtained from the Ministry of Health, Lao PDR.

Characteristics of study sites

Khammouane Province is located about 350 km south-east of Vientiane, the capital of Lao PDR. It has a tropical climate, temperature range of 30-34°C, average humidity of 60-80% and 500-600 mm annual rainfall. The malaria infection rate in the province was 13.2% in 2001 (Khammouane Province Malaria Station, 2001). Of the 9 districts in the province, Bourapar District has the highest risk of malaria. It is located in the eastern part of the province, bordering Vietnam. The district has an area of 3,763 km and consists of 82 villages (3,911 households), of which only 73 received malaria control intervention. An Active Case Detection (ACD) survey showed that malaria prevalence in this area ranged from 5.3 to 10.5% (mostly P. falciparum cases) (Kobayashi et al, 1998). An entomological survey showed that the main malaria vectors were An. minimus. An. dirus and An. nivipes (Kobayashi et al, 1997, 2000).

Study households

Of 73 villages, ten villages were selected as study sites after consideration of geographic characteristics and ethnic differences. A total of 240 households, 60 households from each EPI (Expanded Program on Immunization) zone, excluding Zone 0 and 5, were chosen for the study. EPI zones are based on the distance from the district health office and range from 0 to 5. The total number of households located in the 10 villages was 376 according to the records of the health office.

Socio-demographic characteristics.					
	Zone 1 (n=60)	Zone 2 (n=60)	Zone 3 (n=60)	Zone 4 (n=60)	Total (n=240)
Age (±SD)	43.2 (±14.5)	50.0 (±13.2)	40.7 (±14.9)	38.9 (±14.9)	40.9 (±14.5)
Ethnicity (%)					
Lao Lum	1.7	100.0	100.0	65.0	66.7
Lao Tum	98.3	0.0	0.0	35.0	33.3
Education (%)					
<1 year	40.0	41.7	21.7	51.7	38.8
1-3 years	33.3	20.0	45.0	33.3	32.9
≤4 years	26.7	38.3	33.3	15.0	28.3
Literate	56.7	56.7	71.7	51.7	59.2
Annual imcome (%)					
<us\$100< td=""><td>46.7</td><td>41.7</td><td>8.3</td><td>45.0</td><td>35.4</td></us\$100<>	46.7	41.7	8.3	45.0	35.4
Family members (±SD)	6.4 (±2.8)	6.2 (±2.2)	7.4 (±3.0)	6.9 (±2.4)	6.7 (±2.6)

Table	1
Socio-demographic	characteristics.

Zone 1:3-6 km, Zone 2:7-10 km, Zone 3:10-20 km, Zone 4:20-50 km, from the central health office

Data collection and analysis

Data collection was conducted by the principal author (Shirayama), malaria doctors from the Center of Malariology, Parasitology and Entomology, and local health staff. After informed consent was obtained, each household head, or his/her representative, was interviewed using a structured questionnaire. The questionnaire consisted of: socio-demographics; malaria episodes during the past year; Knowledge, Attitudes and Practices (KAP) related to malaria. The questions about knowledge were open-ended so that respondents could answer freely and without bias.

Decisions with respect to the authenticity of malaria episodes reported by respondents were made by malaria doctors based on the reported clinical symptoms (eq fever and chills, diarrhea, headache etc) and laboratory results if they existed. This method has been adopted in some developing countries where precise diagnosis is difficult (Gomes et al, 1994).

Collected data was analyzed using SPSS version 11.0 J for Windows. The chi-square test was applied. A 5% level was taken as the level of statistical significance.

RESULTS

Socio-demographic characteristics

Table 1 shows the socio-demographic characteristics of the 240 respondents. The mean age was 40.9 (SD ±14.5). Sixty-six point seven percent (160/240) were Lao Lum, and 33.3% (80/240) were Lao Tum. Seventy-one point seven percent (172/240) had less than 4 years of education, and 40.8% (98/240) were illiterate. The mean annual income was 1.3 million Kip (SD ±1.2) (US\$130), and 35.4% (85/240) earned less than 1 million Kip (US\$100). The mean number of family members was 6.7 (SD ±2.6), including 1.5 (SD ±1.3) children under five. The study households had 1,611 family members in total, of which 356 were children under five.

Malaria episodes

Of the 1,611 family members, 180 had contracted malaria during the past year (Table 2). In terms of households, 122 (50.8%) were malaria-free, while 118 (49.2%) reported at least one family member as having contracted malaria.

Knowledge related to malaria

Most respondents could raise the major

	Ta	able 2			
Malaria	episodes	during	the	past	year.

	No. of households	No. of malaria episodes
Did any family member contract malaria during the past year?		
No	122 (50.8%)	
Yes	118 (49.2%)	
If yes, how many family member?		
1 family member	81	81
2	22	44
≥ 3	15	55
Total	118	180

Table 3 Knowledge related to malaria.

	n (%)		n (%)
Symptoms ^a		Preventive methods ^a	
Fever	195 (81.3)	Bed net	223 (92.9)
Diarrhea	175 (72.9)	No breeding site	40 (16.7)
Headache	164 (68.3)	Buy malarial drug	11 (4.6)
Sweat	75 (31.3)	Burn trees or herbs	8 (3.3)
Chills	42 (17.5)	Insecticide spray	1 (0.4)
Vomit	26 (10.8)	Mosquito coil	O (O)
Other	13 (5.4)	Others	117 (48.8)
l don't know	16 (6.7)	l don't know	7 (2.9)
Cause ^a		High risk group	
Mosquito bite	124 (51.7)	Children	135 (56.3)
Sanitation	94 (39.2)	Women	29 (12.1)
Environment	93 (38.8)	Men	27 (11.3)
Unboiled water	87 (36.3)	Old people	14 (5.8)
Food-related	65 (27.1)	Pregnant women	1 (0.4)
Poverty	52 (21.7)	Others	4 (1.7)
Evil spirits	13 (5.4)	l don't know	30 (12.5)
Others	40 (16.7)		
l don't know	48 (20.0)	Total n=240, ^a Multiple an	swer

symptoms (Table 3). However, knowledge of the cause of malaria was poor. Only 51.7% mentioned the relationship between mosquito bite and malaria infection, and 20% had no idea of the cause of malaria. Other causes frequently mentioned were "lack of basic sanitation around houses" (39.2%), "drinking unboiled water" (36.3%), and "food related" (27.1%). In addition, thirteen households (5.4%) answered "evil spirits" as the cause of malaria.

As for preventive measures, 92.9% answered bed nets, and 16.7% mentioned the elimination of mosquito breeding sites. Almost no one mentioned personal protection using consumable items such as insecticidal sprays and mosquito coils.

More than half of the households (56.3%)

correctly regarded children as the high-risk group.

Attitudes related to malaria

The perceived risk of malaria infection was low: 67.5% (162/240) regarded the risk as "low or very low". All the respondents answered that they were interested in malaria prevention activities and would like to have more opportunity to learn about malaria. Ninety-five percent have received malaria education at least once, with the average time being 2.1 times (SD \pm 1.1). Some people (8% or 19/240) reported they have received as many as four to six times.

Practices related to malaria

About 90% (215/240) reported that they use bed nets throughout the year. Of 240 households, 212 (76.7%) owned at least one ITN distributed by the malaria control project. Regarding treatment, 44.6% (107/240) answered "at hospital", 52.9% (127/240) "administration of over-counter drugs (self-treatment)". Six households (2.5%) answered "traditional ways of healing".

Households that perceived evil sprits, or angry "*Phee*" (spirit) of trees and "*Phee*" of ancestors, as the cause of malaria, reportedly used a variety of traditional herbal medicines or religious ceremonies such as chanting and animal sacrificing (eggs, birds, water buffalos, together with alcohols, tobaccos and flowers, etc) as treatment. Table 4 shows the general name, botanical name, dosage and administration of three indigenous medicines popularly used in Lao PDR, which are believed to be effective for malaria among the local people.

Thirteen households believing "evil sprits" as the cause of malaria

The thirteen households which perceived evil sprits as the cause of malaria showed higher perceived risk in comparison to other

General name	Botanical name	Dosage and administration		
Nad Hoa Bay Noy	Artemisia annua L. COMPOSITAE	Boil 15g of dried new buds with jujubes in 1 liter of water for 10- 15 minutes. Divide the mixture into 3 doses and take one dose after each meal.		
Ton Hom Xang	<i>Dichroa febrifuga</i> Lour SAXIFAGRACEAE	Boil sliced, dried and deep-fried roots, with ginger, jujubes, 12g of riptile scales etc in a water. Filter it into 1 beer bottle. Divide the mixture into 3 doses and take one dose after each meal.		
Hoa Pouk or Hoa Ka Pouk	<i>Alocasia macrorrhiza</i> (L.) Schott ARACEAE	hacrorrhiza (L.) Schott Boil 3 slices with 3 pieces of sugar cane and 7 seeds of unpolished rice. If you are not infected with malaria, you feel itchy when you drink it. If you feel OK, then you have to continue drinking it because it means you are infected.		

Table 4 List of traditional medicines good for malaria.

Source: Traditional medicine center, Ministry of Health Lao PDR, 2001

Table 5
Perceived risk and malaria episodes:
households believing in evil spirits and others.

	Evil spirits (n=13)	Others (n=227)	p-value
Perceived risk			
Low	6	191	
High	7	36	0.003
Malaria episodes			
<2 cases	8	195	
≥2 cases	5	32	0.034

households (Table 5). They also reported more malaria episodes during the past year.

DISCUSSION

Our study revealed that indigenous health beliefs and animist practices still exit, and could potentially influence malaria preventive behavior in rural Lao PDR. Although several studies in Africa had reported the perception by some people of "evil spirits" or supernatural things as the cause of malaria (Tarimo *et al*, 2000; Comoro *et al*, 2003), such reports are new in Southeast Asia.

It is surprising to find that more than half the respondents could not correctly answer the cause of malaria as mosquito bite, although 95% had received malaria education. This data is supported by the comments of several household heads: "mosquitoes cannot be the cause of such severe illness because we get bug bites almost everyday!". Our study also revealed that the residents regarded sanitation, environment, unboiled water, foodrelated issues, poverty, or evil spirits as the cause of malaria, which have not been found in the previous paper (Uza et al, 2002) in which the question on knowledge (cause) was designed to choose a single answer from six preselected options. The answers of sanitation, environment, unboiled water, and food-related issues in our study suggest that residents may

be confused by messages of other health education programs.

In comparing the data of Uza et al (2002) against our findings we noted the following changes: knowledge of bed net as preventive method increased from 63.8% in 1999 to 92.3% in 2003; furthermore, the usage of bed net increased from 73.5% in 1999 to 90% in 2003, which suggest that the malaria bed net promotion activities by the project has been successfully applied in the study site. However, knowledge of mosquito bite as the cause of malaria has risen only slightly from 40.6% in 1999 to 51.7% in 2003. While people know the importance of bed net use and do use them, they do not know the cause of malaria well. It is possible that people use the nets only for reducing the nuisance of any bugs (not only mosquitoes), as reported in other studies (Klein et al, 1995; Nawaz et al, 2001). Therefore, in order to ensure the long-term retention of the message of malaria control and to guard against the rapid decline in use of bed-nets following the conclusion of malaria education sessions, we recommend that greater emphasis be placed in informing the people of the basic causes of malaria.

Although western medicine and health education have been widely available in the community, thirteen households believed that evil spirits caused malaria and six households relied on traditional medicine and/or religious ceremonies for treatment. The following studies discuss the mechanisms supporting such beliefs: animal-sacrifice ceremonies functioning not only as a religious practice, but also in the distribution of essential meat protein as an important part of the daily lives of villagers (Yukio, 2003); distrust of western medicine because of ineffective drugs caused by increasing drug resistance (Mayxay et al, 2003), and fake drugs (Newton et al, 2001) widespread in the area due to lack of systematic quality control and poor knowledge among drug sellers and consumers in Lao PDR

(Syhakhang *et al*, 2004). Inaccessibility to schools and local health care services may also help explain the prevalence of traditional beliefs.

In comparison to households which did not believe evil spirits was the cause of malaria, the households which believed evil spirits were the cause of malaria also perceived a greater risk of malaria and had more malaria episodes. The forceful exclusion of such beliefs is therefore not recommended. An excellent example of a culturally appropriate method of addressing this issue is to be found in the example of health education conducted in Buddhist temples (Yukio, 2003). In this study, religious leaders and villagers demonstrated good performance in promoting toilet use, hand-washing, bed-net use, family planning, etc. Indigenous herbal medicines are also recently attracting global attention, offering the possibility of "evidence-based use of traditional anti-malarial methods" in the future (Bodeker and Willcox, 2000)

We concluded that some villagers still rely on indigenous health beliefs despite having received information regarding modern malaria control. Future malaria control programs should be implemented respecting those living with indigenous beliefs, as well as revising the education program based on our findings. Regulated use and quality control of anti-malarial drugs are also important to stop growing drug resistance and widespread ineffective drugs such that all villagers will gain greater trust in western drugs.

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