

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING DENGUE AMONG PEOPLE IN PAKSE, LAOS

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ABSTRACT

Dengue fever (DF) is an acute febrile disease, caused by infection of dengue virus transmitted by the female *Aedes* mosquito. This is the second leading cause of deaths in Champasack Province, where Pakse district has the highest number of this outbreak. This cross-sectional study was designed to assess the knowledge, attitude, and practice of people regarding dengue disease in 9 villages of the Pakse district from July to September 2006. Purposive sampling was done to collect data from 230 subjects. They had a fair knowledge about the vector 163 (70.9%). For 101 (43.9%) respondents, their main source of information about dengue was their friends or relatives. It is encouraging that 217 (94.3%) respondents had a positive attitude that DF can be treated, and that 222 (96.5%) knew they should visit a doctor when they suffer from it. About 196 (85.2%) people stored water at home but infrequently changed it. The study indicated that the community was quite familiar with Dengue, but that there was some confusion about vaccination and water storage for domestic use. Dengue awareness activity should be included at the school and college level. Radio and television should play an important role in conveying health information to the public, and regular visits of health personnel to the villagers should be ensured.

Key Words: Dengue fever, Knowledge, Attitude, Practice, Pakse, Laos

INTRODUCTION

Dengue fever (DF) is an acute febrile disease due to a viral infection and presents with severe headache, pain in the eyes, muscle and joint pain as well as rash. Dengue hemorrhagic fever (DHF) presents with dengue-like symptoms in addition to hemorrhagic manifestations; for example, petechial skin hemorrhage, hepatomegaly, and circulatory disturbances. Dengue is caused by the infection of dengue virus, a flavivirus in the family of *Togaviridae*.¹⁻³⁾ There are four known virus serotypes (DEN 1, DEN 2, DEN 3, and DEN 4).⁴⁾ The virus is transmitted by the *Aedes* mosquito, of which *Aedes aegypti* is the most important vector.¹⁻³⁾

The first reported epidemics of DF occurred in 1779–1780 in Asia, Africa, and North America.

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The near simultaneous occurrence of outbreaks on three continents indicates that these viruses and their mosquito vector have had a worldwide distribution in the tropics for more than 200 years. A pandemic of dengue began in Southeast Asia after World War II and has spread around the globe since then.⁵⁾ The dengue virus infection is prevalent across the tropical belt in over 100 countries, with 2.5 billion people at risk of acquiring the infection and an estimated 50 million infections and 500,000 cases of DHF, which is the severer subtype cases occurring annually.⁶⁾ Global trends in urbanization, substandard housing, intentional or unintentional water storage patterns, and population growth have created environments that favor transmission of DF. The global dengue pandemic has intensified during the past two decades until it now affects all continents except Antarctica. Dengue epidemics are increasing in frequency as well as in the severity of illness they produce.⁷⁾ Over the past 20 years, there has been a dramatic increase in the incidence and geographical distribution of DHF, and epidemics now occur each year in some Southeast Asian countries.⁴⁾ Dengue virus infection causes significant morbidity and mortality worldwide. Although it is initially believed that an infection mainly afflicted the pediatric age group, this infection has been rapidly spreading across all age groups. In Southeast Asia, epidemic DHF first appeared in the 1950s, but by 1975 it had become a frequent cause of hospitalization and death among children in many countries in that region.⁵⁾

In Laos, the first case of dengue was diagnosed in 1977 by Dr. Phonthape Pholsena. Since that time the number of patients has increased every year. The greatest disease burden of dengue was in 1985 and 1987 which threatened the Vientiane population. In 1995, there were reports of 7,781 cases of dengue with 31 deaths. The disease burden of dengue has grown dramatically in recent decades, and it is currently classified as a health problem.⁸⁾ Dengue used to be one of the top ten causes of deaths in Laos in 1996. So far the disease has continued to afflict many people and cause death.⁹⁾ Champasack Province is located in the southern part of Laos. Pakse is the largest district in that province where the present study was carried out. The district consists of 67 villages and 12,442 households, with a total population of 77,096.¹⁰⁾ Champasack Province and the Pakse district in particular are considered to have the highest number of dengue cases in Laos. A report in 2005 which covered from January to December in that year reflected the incidence of dengue diseases in 10 districts of this area, particularly in the Pakse district. The total morbidity was 630.¹¹⁾ From the prevention standpoint, there is a need to investigate the people's knowledge, attitude and practice regarding dengue.

According to a report in 2000, malaria was the leading cause of death (40.9%) followed by pneumonia (33.4%) in Laos.¹²⁾ In Champasack Province malaria is the main cause of death but dengue (27%) is the second major cause (Annual Report of Champasack Hospital, Southern part of Laos, 2005). Thus, dengue diseases in this area must have been investigated more intensively, because there has been no research yet. The objective of this study was to assess the knowledge, attitude and practice of the people regarding DF in the Pakse district, Champasack Province.

MATERIALS AND METHODS

This is a cross-sectional study conducted in 9 villages of Pakse district in Champasack Province during July to September 2006. The study population included people who had suffered from DF and/or were treated within less than two years. Almost all of the respondents were diagnosed from both symptoms and laboratory tests from the hospital. Persons who had not suffered from DF were excluded from the survey. The data were collected by a face-to-face interview with residents of households with a history of DF.

The questionnaire was divided into four parts; the first part covered questions on socio-

demographic characteristics, the second part was about knowledge, the third part was related to practices and the fourth part was concerned with their attitude to DF.

Data were analyzed using the Statistical Package for Social Sciences (SPSS), version 15.0.

RESULTS

Socio-demographic characteristics of respondents

The socio-demographic characteristics of these respondents are given in Table 1. The table shows that, among 230 eligible persons interviewed, 161 (70.9%) were female and 69 (30.0%) were male. About 46.5% of them were in age group 31–45 years, followed by 36.5% in the 15–30 year age group.

Among them 223 (97.0%) were Buddhist, and only 7 (3.0%) were Catholic. Among the respondents, 81 (35.2%) were in preliminary school. Sixteen (7.0%) had received a college

Table 1 Socio-demographic characteristics of the respondents

Factor	No. of respondents	Percentage (%)
Sex:		
Male	69	30.0
Female	161	70.0
Age:		
15–30 yrs	84	36.5
31–45 yrs	107	46.5
46–60 yrs	35	15.2
61–5 yrs	4	1.7
Religion:		
Buddhist	223	97.0
Catholic	7	3.0
Education:		
Illiterate	10	4.3
Primary school	81	35.2
Lower secondary school	68	30.0
Upper secondary school	51	22.2
University	16	7.0
Vocational training	4	1.7
Occupational:		
Unemployed	16	7.0
Employed	18	7.8
Labor	30	13.0
Merchant	70	30.4
Students	21	9.1
Housewife	75	32.6

education, and 10 (4.3%) had no education. Sixty-eight respondents (30.0%) were lower secondary school level, and only 4 (1.7%) had vocational training. As to occupation, the highest number of respondents, 75 (32.6%), were housewives followed by merchants, 70 (30.4%), and laborers, 30 (13.0%).

Knowledge of Dengue disease

The proportions of respondents having knowledge about DF, its transmission, prevention and control are shown in Table 2. As for awareness of DF symptom, fever was the most common symptom in 173 out of 230 (75.2%), followed by skin rash in 43 (18.7%), and 7 (3.0%) of the respondents knew that bleeding from the nose is one of the typical symptoms.

Two hundred and fifteen of the respondents (93.5%) knew that DF is a disease transmitted by mosquito bites and 163 mentioned *Aedes* mosquitoes as the main disease vector. The most common breeding place for *Aedes* mosquitoes recognized was water containers such as boxes, pots, cans, etc. (93.9%), followed by stagnant water reserves like the ponds/streams (5.6%) (Table 2).

As for their sources of DF information, the majority of the respondents 101 (43.9%) mentioned that they knew about DF from relatives/friends, and 61 (26.5%) obtained knowledge through radio/television.

According to 96 (41.7%) respondents, abate/insecticide was recognized to be the most common countermeasure to control DF. Respondents also preferred mosquito nets 55 (23.9%) and covering water containers 46 (20.0%). When asked about the timing of the mosquito biting habits, 150 (65.2%) respondents indicated that it is during the daytime, while about 24 (10.4%) respondents thought it is at night, and 25 (10.9%) that it was in the morning.

Awareness of DF

Table 3 reveals that the majority of the respondents (70.9%) knew that DF is a severe disease, and 50 respondents (21.7%) thought that it could be treated by drinking much water or taking Non-steroidal anti-inflammatory drugs, such as acetaminophen. Also, 222 (96.5%) respondents had a positive attitude toward visiting a doctor when they suffer from DF.

Fifty-two (22.6%) felt it was mainly the government's responsibility to control DF. Another third of the respondents think that prevention should be implemented both by the government and people.

Although we tried using the analytical method, we could not find any clear relations among items. Only between the education level and the risk of DF we could obtain data which showed a tendency of increasing correct knowledge regarding the education level (data shown as Table 4).

Actual DF prevention

Table 5 shows the treatment-related information on DF disease. 146 (63.5%) preferred to visit a doctor, followed by 51 (22.2%) who chose to be treated at home. 28 (12.2%) did not know how to treat it, and only 5 (2.2 %) used traditional medicine.

As for home treatment of DF, 114 (49.6%) respondents mentioned that they used medicine (acetaminophen) to reduce fever, followed by 56 (24.3%) who said drinking much water is effective to reduce fever. 56 respondents (24.3%) preferred both medicine and drinking water to reduce fever. As to the habit of storing water, 196 (85.2%) stored water at home and 34 (14.8%) did not. Out of 196 respondents, 20 (10.2%) frequently changed stored water and 176 (89.8 %) did not.

The most common measure to prevent mosquito bites for 182 (79.1%) respondents was the

DENGUE AWARENESS AMONG PEOPLE OF LAOS

Table 2 Knowledge of dengue fever (DF)

Factor	No. of respondents	Percentage (%)
Symptoms of DF		
Fever	173	75.2
Skin rash	43	18.7
Bleeding from nose	7	3.0
All of the above	7	3.0
Transmission		
Mosquito bites	215	93.5
Don't know	13	5.7
Sharing food with infected people	2	0.9
Mosquito vectors of DF		
Aedes	163	70.9
Anopheles	25	10.9
Culex	2	0.9
Don't know	40	17.4
Breeding sites of mosquitoes		
Boxes, pots, cans, water containers	216	93.9
Ponds, rivers	13	5.7
Forest	1	0.4
Source of information		
Health personnel	16	7.0
Radio/TV	61	26.5
Newspaper/Magazine	52	22.6
Relatives and friends	101	43.9
Way to prevent DF		
Addition of abate/insecticide	96	41.7
Covering water containers	46	20.0
Using mosquito net in daytime	55	23.9
Changing water frequently	33	14.3
Biting time of mosquitoes		
Dawn	15	6.5
Morning	25	10.9
Daytime	150	65.2
Night	24	10.4
Any time	16	7.0

use of a mosquito net. Mosquito coils were used by 23 (10.0%), spray insecticides by 20 (8.8%), and use of repellents by 5 (2.2%).

Table 3 Awareness regarding dengue fever (DF)

Factor	No. of respondents	Percentage (%)
Risk of DF		
Severe	163	70.9
Not severe	50	21.7
Do not know	17	7.4
DF treatability		
Yes	217	94.3
No	7	3.0
Do not know	6	2.6
Attitude of respondents with DF		
See a doctor	222	96.5
See a traditional physician	1	0.4
Buy medicine yourself	7	3.0
Knowledge of DF recurrence		
Yes	93	40.4
No	86	37.4
Do not know	51	22.2
Who should be responsible for mosquito control?		
Government	52	22.6
Yourself	30	13.0
Both	148	64.3

Table 4 Education as to the risk of dengue fever (DF)

Factor	Risk of DF			Total
	Severe	Not severe	Do not know	
Education:				
Illiterate	6 (60.0%)	0 (0.0%)	4 (40.0%)	10
Primary school	50 (61.7%)	25 (30.9%)	6 (7.4%)	81
Lower secondary school	49 (72.1%)	14 (20.6%)	5 (7.4%)	68
Upper secondary school	45 (88.2%)	5 (9.8%)	1 (2.0%)	51
College	10 (62.5%)	5 (31.3%)	1 (6.3%)	16
Vocational training	3 (75.0%)	1 (25.0%)	0 (0.0%)	4
Total	163 (70.9%)	50 (21.7%)	17 (7.4%)	230

DENGUE AWARENESS AMONG PEOPLE OF LAOS

Table 5 Actual dengue fever (DF) prevention

Factor	No. of respondents	Percentage (%)
What you do in first stage of fever?		
Treat myself at home	51	22.2
Do not know	28	12.2
Take traditional medicine	5	2.2
See a doctor	146	63.5
At home, what do you do in the first stage of fever?		
Reduce fever by taking medicine (acetaminophen)	114	49.6
Take aspirin	1	0.4
Drink a lot of water	56	24.3
Take medicine and drink water	56	24.3
Do not know	3	1.3
Do you store water at home?		
Yes	196	85.2
No	34	14.8
If yes, do you frequently change the stored water until it runs out?		
Yes	20	10.2
No	176	89.8
What measures do you take to prevent mosquito bites?		
Use mosquito coil	23	10.0
Use mosquito net	182	79.1
Spray insecticides	20	8.7
Use repellents	5	2.2

DISCUSSION

Our study revealed that almost all respondents to the questionnaires are familiar with dengue disease. Relatives and friends were one of their main sources of information. This illustrates good communication and common exchange of information among people. Health personnel are the second source of the information.

The majority of respondents are aware of symptoms of DF. Most were able to recognize high fever, joint pain, and headache as the main symptoms. This was probably due to the educational message from the mass media that the primary symptom of dengue is a high fever of sudden onset with joint pain. Their ability to recognize the signs and symptoms of dengue was important for them to seek early treatment. Knowledge of biting habits may be important, and many respondents correctly replied that the biting time was during the day. This fact shows that methods of preventing mosquito bites such as mosquito coils and bed netting are usually used at night, which are not effective in prevention. This point might be the focus in educating people regarding prevention of DF. Despite the knowledge that stagnant water is a breeding site

for *Aedes* and availability of piped water has become more popular, most people store stagnant water. The reason is that piped water in this area does not flow smoothly, and blockages sometimes occur, so people tend to store water in containers. This discrepancy between knowledge and practice implies that good knowledge does not necessarily lead to good practice.

An earlier survey in an urban community of Thailand revealed that covering water containers was the most common practice to prevent mosquito breeding in drinking-water containers, whereas the addition of abate (tempos sand granules) or changing stored water frequently may be done.¹³⁾ It is encouraging to learn from our study that most of the populations of south Laos had the idea that DF can be treated by several means and many people have a positive attitude towards the treatment of the disease. Almost all believed that they should visit a doctor when they realized they were suffering from DF given the typical symptoms. Although the majority of respondents were aware of the breeding site of the DF vector, only a few replied that changing storage water is a major way to prevent breeding. Moreover, a large number of people were not aware of the severity of DF. The media could play a vital role to provide information in this regard.

The results of this study were discussed bearing in mind certain errors and limitations. First, there may have been some biases at the interview stage. Despite training, different interviewers tend to phrase questions differently, which might result in different responses. This is further exacerbated when the respondents do not understand the question, forcing the interviewer to explain it and thus inevitably giving clues to the respondents. Second, there may have been errors at the respondent stage. Due to the customary hospitality of village people in the Pakse district, interviewers were received as guests. The respondents may tend to agree with the interviewers when asked attitudinal questions in order to please their 'guests'. Lastly, the study focused only on persons who suffered from, or had been treated for DF.

Based on this study, it is recommended that a health education program could be effective in improving the knowledge of the rural community. A change in the approach of the health education program in media is also stressed based on the findings that good knowledge has not necessarily led to good practice of control measures. Therefore, health personnel should be trained to give more appropriate counseling in an effort to change certain deeply ingrained traditional habits like domestic water storage without a proper cover.

In conclusion, it was found that only knowledge or attitude does not necessarily lead to good practice. Dengue awareness activity must be carried out at the school and college level a more ubiquitous public health program. Radio and television must also play an important role in conveying health information to the public, and regular visits of health personnel to the villagers are warranted as well.

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DENGUE AWARENESS AMONG PEOPLE OF LAOS

REFERENCES

- 1) Hairi F, Ong CH, Suhaimi A, Tsung TW, Ahmad MAA, Sundaraj C, Soe MM. Knowledge, Attitude and Practices (KAP) Study on Dengue among selected rural communities in the Kuala Kangsar district. *Asia Pac J Public Health*, 2003; 15: 37–43.
- 2) World Health Organization. Dengue and dengue haemorrhagic fever. Fact Sheet No. 117, April 2002. 2002; WHO, Geneva.
- 3) Gubler DJ. Dengue and dengue hemorrhagic fever. *Clin Microbiol Rev*, 1998; 11: 480–496.
- 4) World Health Organization. Dengue and Dengue hemorrhagic fever. 3–9. WHO, Geneva.
- 5) Centers for Disease Control and Prevention. Dengue Fever. Division of Vector-Borne Infectious Diseases. 2005; CDC, Atlanta.
- 6) Guglani L, Kabra SK. T cell immunopathogenesis of dengue virus infection. *Dengue Bull*, 2005; 29: 58–68.
- 7) Environmental Health Project, Dengue Fever: An Environmental Plague for the New Millennium? 1–8, 1999; Camp Dresser & McKee International Inc, Cambridge, Massachusetts.
- 8) Laos National Textbook for Treatment Guideline, 45–78, 2001; Ministry of Health, Laos PDR.
- 9) National Institute of Public Health. Health status of the people in Laos PDR. 37, 2001; Vientiane, Laos.
- 10) Mahlaath S. Training manual. 4–6, 2005; Planning and Investment Department, Champasack Province, Laos.
- 11) Epidemiological Section of Public Health Department/Malaria Control Institute Province Branch in Pakse District, 2005; Champasack Province, southern Laos.
- 12) World Health Organization. Western Pacific Country Health Information Profile Revision, 129–141, 2006; WHO, Geneva.
- 13) Swaddiwudhipong W, Lerdlukanavongse P, Khumklam P, Koonchote S, Nguntra P, Chaovakiratipong C. A survey of knowledge, attitude and practice of the prevention of dengue hemorrhagic fever in an urban community of Thailand. *Southeast Asian J Trop Med Public Health*, 1992; 23: 207–211.