HUMAN BEHAVIOR IN RELATION TO SELECTION OF MALARIA TREATMENT

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Abstract. People in rural areas usually help themselves when malaria attacks by using a drug preparation under the name of *"ya-chud"* bought from the grocery in the village. The objective of this study was to determine the behavior towards malarial treatment of local inhabitants in two malarious areas in eastern Thailand.

Groups of 271 and 131 local inhabitants in villages in Pong Nam Ron and Bo Thong Districts, respectively, aged more than 15 years were interviewed regarding health bahavior in seeking care when they became ill with malaria.

Forty-two percent of the population at Pong Nam Ron and fifteen percent at Bo Thong went to drug-stores or groceries when they developed minor illness, while 85.2% of the subjects interviewed at Bo Thong went to the local health center. However, when they became severely ill, treatment-seeking patterns were similar in the two study areas.

Ninety-four percent of the subjects interviewed at Bo Thong and eighty-seven percent at Pong Nam Ron gave a history of having used *ya-chud* in the past. On average, a set of *ya-chud* for malaria infection consists of 3-5 drugs : antimalarial drugs together with others such as analgesic-antipyretics, steroids, anti-histamines, vitamins and antimicrobial agents (tetracycline). The price of one *ya-chud* varied from 3-9 baht. Such improperly use of antimalarial drugs in malarious areas can result in treatment failure and cause the development of drug resistance, which is a problem in the malaria control program in Thailand.

INTRODUCTION

Malaria has been a major health problem of Thailand for more than a century. At present there are three major difficulties confronting the Anti-Malaria Program. These are the exophilic behavior of malaria vectors, occupational migration, and the rapid dissemination of *P. falciparum* strains highly resistant to both 4-amino-quinolines and sulfadoxine/pyrimethamine. Recently, mefloquine resistance has also been reported in the treatment of *P. falciparum* (Webster *et al,* 1985 ; Boudreau *et al,* 1982). One of the problems affecting drug resistance has been the lack of strict government drug control. When people in rural areas become ill, they help themselves by using *"ya-chud"* (a set of several drugs containing various active ingredients in each sample collected in a plastic bag) bought from the grocery shop (ran-cham) (Jaidee *et al,* 1980 ; Wiwat *et al,* 1982) in the village. Most *ya-chud* is composed of unnecessary, luxurious and inappropriate items, and is liable to cause treatment failure, drug toxicity and drug resistance, which is a problem for the malaria control program. Generally, many strains of *P. falciparum* resist antimalarial drugs if an insufficient dose of the drug is taken or if the duration of the medication is inappropriate. Therefore, the objective of this study was to determine the treatment-seeking habits of local inhabitants in two malarious areas (Pong Nam Ron and Bo Thong) in eastern Thailand in seeking care when they became ill with malaria.

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MATERIALS AND METHODS

Study areas

Bo Thong District, located in Chon Buri Province 87 km southeast of Bangkok, was selected since malaria transmission is known to be moderate in that area, which contains a large number of workers who temporarily migrate from the northeast region to work in sugar cane and cassava plantations (Malaria Sector, 1989a). There is a new local health center in the study area; the 10-bed district hospital is quite far from the village and difficult for the inhabitants to access.

Pong Nam Ron District, located in Chanthaburi Province 230 km southeast of Bangkok, where malaria transmission was likely to be high, lies along the Thai-Cambodian border which is known to be highly endemic for multidrug-resistant falciparum malaria (Malaria Sector, 1989b). There is one local health center and a 30-bed district hospital in the study area.

Study population

Two hundred and seventy-one local inhabitants living in one village of the Pong Nam Ron District and 131 in Bo Thong District aged above 15 years were interviewed regarding health behavior when seeking care during episodes of malaria.

Study of *ya-chud* in treatment of malaria

A structured interview form was used to obtain information on social and demographic data, knowledge of malaria, health behavior, treatment-seeking patterns, history of using *ya-chud* in treatment of malaria and places where *ya-chud* for malarial treatment could be obtained.

Ten local inhabitants were asked to act as malarial patients by presenting malaria-like symptoms to the proprietors in the village gloceries or drugstores which we had identified during the health interview survey. The research assistants bought the drug suggested to them in the shops.

Drug packages obtained by ten local inhabitants were collected and presented to studied subjects. Questionnaires assessing behavior of using these drug packages were also carried out, including a survey of the consumption of *ya-chud,* frequency, duration, indication and method of administration.

The analysis of the drugs in *ya-chud* were classified according to shape, size, color, odor and taste, compared to the authentic drugs. Some of the uncertain drugs were tested, using color tests (Clarke, 1969).

RESULTS

Base-line observations

Sixty-eight percent of the studied population were males and thirty-two percent females. Most subjects (72.0%) had finished grade four level but 14.5% had no formal education, 64.2% were farmers with low economic status.

Approximately 65% of the subjects interviewed gave a history of malarial illness in the past and many had a history of more than one episode. The annual parasite incidence of malaria was 169.4/1,000 and 149.6/1,000 population at Bo Thong and Pong Nam Ron, respectively.

Knowledge about malaria

Only 30% of interviewed subjects at Bo Thong and 54% at Pong Nam Ron gave a correct answer about the nature of transmission of malaria; however, most of them (90%) knew the symptoms of malaria.

Behavior in regard to malarial treatment

On appearance of minor illness: The first places where most people (42.4%) from Pong Nam Ron went when they developed a minor illness was either the village gloceries selling *ya-chud* for malarial illness or the drug stores in town (Fig 1). The second most frequent places of treatment were the local health center and the district hospital (24.6%). In contrast, 85.2% of the subjects interviewed at Bo Thong went to the local health center when they were sick, 14.8% went to the groceries in the village to buy *ya-chud,* while no one went to the district hospital or to a private clinic.

On appearance of severe illness: When the studied subjects became severily ill, treatment-seeking patterns in the 2 study areas were similar. Fig 2 shows that most people at both Pong Nam Ron (83.7%) and Bo Thong (75.4%) went to the district hospital. However, 23% of local inhabitants at Bo Thong went to the local health center, compared

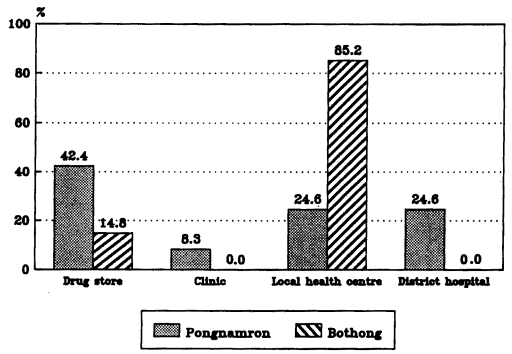

Fig 1—Treatment of choice when getting minor illness.

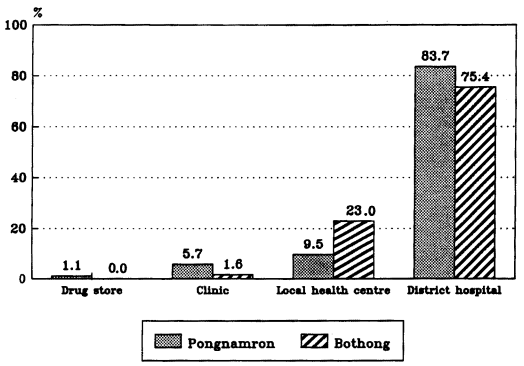

Fig 2—Treatment of choice when getting severe illness.

to 9.5% of people at Pong Nam Ron. Only a few went to drugstores or groceries.

Ya-chud for malarial infection

22 samples of *ya-chud* were collected from 5 groceries (ran-cham) in the village and 2 drugstores in town of Pong Nam Ron District. Chanthaburi Province. However, some groceries or drugstores sold the same *ya-chud.* After collection of all *ya-chud* samples, we identified only 5 different kinds. We also observed that *ya-chud* bought at different times was not identical.

At Bo Thong we collected 3 kinds of *ya-chud* from 20 samples bought from 8 village groceries.

Ninety-four percent of subjects interviewed at Bo Thong and eighty-seven percent at Pong Nam Ron gave a history of having used *ya-chud* previously (Fig 3). Most of them did not know even the name of the drug they had taken.

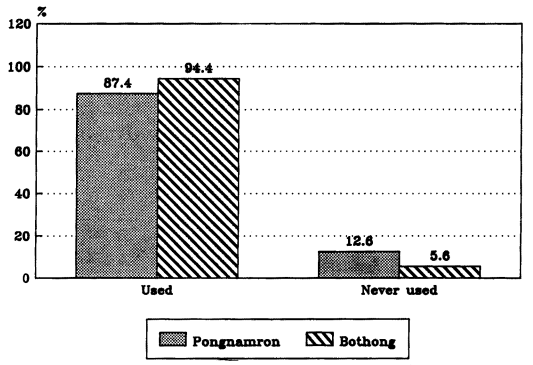

Fig 3—Use of *ya-chud.*

Thirty-eight percent of the patients were advised by the drug-sellers to take *ya-chud* once a day until the illness was relieved (about 1 week). Twice or three times a day of administration were sometimes recommended.

On average, a sample of *ya-chud* contained 3-5 but most commonly 4 drugs (Table 1, 2). The most common antimalarial in *ya-chud* at Bo Thong as well as at Pong Nam Ron, was sulfadoxine plus pyrimethamine. However, we also found quinine, pyrimethamine plus dapsone at Pong Nam Ron. Other categories of drugs present were analgesic-antipyretics, antimicrobial agents (tetracyclines), vitamins or ferrous sulfate, steroids and antihistamines.

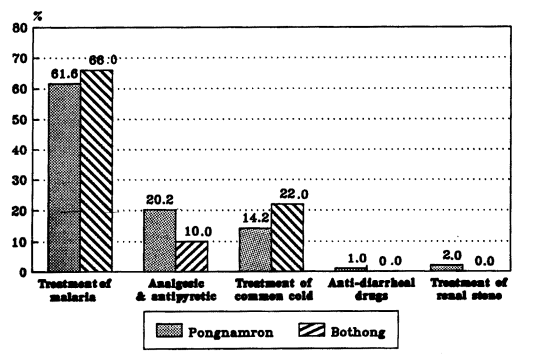

Fig 4—Indications of using *ya-chud.*

Table 1

Characteristics of *ya-chud* for malarial treatment at Pong Nam Ron.

Package No.	Active ingredients	Quantity (No. of tablets or capsules)	Price per package (Baht)
1.	1. sulfadoxine (500 mg) + pyrimethamine (25 mg)	1	3
	2. dipyrone (500 mg)	1	
	3. chlorpheniramine (4 mg)	1	
	4. ferrous sulfate	1	
2.	1. quinine (300 mg)	1	5
	2. dipyrone (500 mg)	1	
	3. dexamethazone (0.5 mg)	1	
	4. $B_{1\text{-}6\text{-}12}$	1	
3.	1. quinine (300 mg)	1	5
	2. tetracycline (250 mg)	1	
	3. paracetamol (500 mg)	2	
	4. chorpheniramine (4 mg)	1	
4.	pyrimethamine (12.5 mg) + dapsone (100 mg) (Maloprim®)	1	6
5.	1. sulfadoxine (500 mg) + pyrimethamine (25 mg) (Fansidar®)	1	9
	2. metamizole sodium (Pyrana®) (500 mg)	1	

(Baht 25.5 = $1)

The price of one *ya-chud* varied from 3-9 baht. Indications for use of *ya-chud* are shown in Fig 4. Instead of using *ya-chud* for treatment of malaria, some people used it for analgesic-antipyretic effects and treatment of the common cold.

DISCUSSION

Treatment-seeking patterns of the population at Pong Nam Ron were similar to those reported in many studies (Wiwat *et al,* 1982; Fungladda and Sornmani, 1986; Hongwiwatana *et al,* 1985). When getting minor illness, most people went to groceries or drugstores; but when severely ill, they went to the district hospital. The main reasons why most studied subjects at Bo Thong went to the local health center for a minor illness may be : (1) the local health center at Bo Thong has just been established in the village and is easy of access; (2) personnel at the health center have a good relationship with the local people; (3) no private clinic is available in the study area; and (4) communication between the studied village and the district hospital is quite difficult, especially during the rainy season.

We have found that the choice of health services depended partly on distance and the cost. Most subjects were agriculturists and labor workers. Their income was irregular, and they usually did not go to the hospital if it was too far away and they would leave their work without pay.

In both study areas, most people gave a history of using *ya-chud* in the past because *ya-chud* was freely available in drugstores or even groceries. Moreover, the price of a package was quite low

Table 2

Characteristics of *ya-chud* for malarial treatment at Bo Thong.

Package No.	Active ingredients	Quantity (No. of tablets or capsules	Price Per package (Baht)
1.	1. sulfadoxine (500 mg) + pyrimethamine (25 mg)	1	3
	2. paracetamol (Nutamol®) (500 mg)	1	
	3. paracetamol (325 mg)	1	
	4. prednisolone (5 mg)	1	
2.	1. sulfadoxine (500 mg) + pyrimethamine (25mg)	1	3
	2. paracetamol (Nutamol®) (500 mg)	1	
	3. aspirin (500 mg)	1	
	4. chlorpheniramine (4 mg)	1	
3.	1. tetracycline (250 mg)	1	5
	2. aspirin (500 mg)	1	
	3. aspirin (325 mg)	1	
	4. multivitamin	1	

and could be afforded by poor people.

Most *ya-chud* for malarial infection is composed of unnecessary drugs such as antihistamines, vitamins and steroids. Steroids in *ya-chud* can have adverse effects, eg immuno-suppression, peptic ulcer. The unneccessary drugs used in *ya-chud* would have no effect on the malarial parasites, but might relieve symptoms or mask the more severe effects of malarial infection. The improper use of the drugs, including the insufficient dose of antimalarials in *ya-chud,* the improper combinations, the inappropriate duration of treatment, not only can cause failure of treatment but also could contribute to the selection of drug resistant parasite strains which is a major problem in the malaria control program in Thailand.

The results of this study suggest that particular attention should be given to health education about malaria and about behavior of people seeking care. Strict control of drug standards by the government is also essential.

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