

# MALARIA AMONG HILLTRIBE COMMUNITIES IN NORTHERN THAILAND: A REVIEW OF CLINICAL MANIFESTATIONS

A Suyaphun<sup>1</sup>, V Wiwanitkit<sup>2</sup>, J Suwansaksri<sup>3</sup>, S Nithiuthai<sup>4</sup>, S Sritar<sup>3</sup>, W Suksirisampant<sup>5</sup>,  
and A Fongsungnern<sup>5</sup>

<sup>1</sup>Mae Chaem Hospital, Chiang Mai; <sup>2</sup>Department of Laboratory Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok; <sup>3</sup>Department of Clinical Chemistry, Faculty of Allied Health Sciences, Chulalongkorn University, Bangkok; <sup>4</sup>Division of Parasitology, Department of Pathology, Faculty of Veterinary Science, Chulalongkorn University, Bangkok; <sup>5</sup>Department of Parasitology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

**Abstract.** Malaria is an important vector-borne disease in the tropics. Northern Thailand is endemic for malaria. We reviewed the clinical manifestations presented by patients with malaria; our data were drawn from the database of Mae Chaem Hospital, Chiang Mai Province. Mae Chaem district is hilly and rural. More than 80% of the district's population are members of hilltribes. The database showed that between July 2000 and April 2001, a final diagnosis of malaria was made in 94 cases. The commonest clinical manifestation was fever (in 91 cases; 96.8%), followed by chills (in 57 cases; 60.6%). Interestingly, some unusual presentations such as petechiae, abnormal menstruation, and jaundice were also found.

## INTRODUCTION

Malaria is caused by a protozoan parasite which is transmitted by the bite of the *Anopheles* mosquito. Malaria is the most important human parasitic disease, affecting over 200 million people and causing more than one million deaths each year. Thailand, especially the country's rural areas, is endemic for malaria (Chareonviriyaphap *et al*, 2000).

The parasite which causes the disease is called *Plasmodium*, which has four species that affect humans: *P. vivax*, *P. ovale*, *P. malariae*, and *P. falciparum*. Humans are infected when a female anopheles mosquito injects a small, mobile form of the parasite, called a sporozoite, into the blood while having a meal. These sporozoites are carried to the liver, where they reproduce. By this process, a single sporozoite eventually produces several thousand of so-called daughter merozoites, which discharge from burst liver cells into the blood. It is at this stage that the symptoms are noticed. Once they are in the blood stream, the merozoites enter red blood cells. The parasite can then be seen in red blood cells when they are examined under the microscope. Within the red blood cell further reproduction takes place and between six and 24 daughter merozoites are released. Each of these is capable of invading a new red cell, and so the cycle is repeated (Clark and Schofield, 2000).

Symptoms of malaria generally take around six days to appear after infection. A wide range of symptoms has been described. Most symptoms are vague and non-specific. Some patients complain of a headache, fatigue, and muscle aches; high fever is common. However, these symptoms are similar to those of viral illnesses and may be mistaken for those of influenza. We report on a review of the clinical manifestations of 94 patients with malaria in an endemic area of Thailand.

## MATERIALS AND METHOD

The setting for this study was Mae Chaem district, Chiang Mai Province, Thailand. Mae Chaem is about 800km from Bangkok. The district is hilly and rural; more than 80% of the population of this district are members of hilltribes. A Malarial Control Office has been set up.

This retrospective study focussed on the clinical manifestations of those hospitalized with malaria. The Mae Chaem Hospital database (July 2000 to April 2001) was the source of data: a final diagnosis of malaria was made in 94 cases. A review of the clinical manifestations of all these cases was carried out. The data were analyzed by the Microsoft Excel program.

## RESULTS

The average age of our subjects was  $27.29 \pm 17.60$  years (range: 11 months to 96 years). The average period before going to visit the physician was  $5.44 \pm 5.27$  days (range: 1 day to 30 days). The most common manifestation was fever (91 cases, 96.8%), followed by chills (57 cases, 60.6%). Interestingly, some unusual

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Correspondence: Jamsai Suwansaksri, Department of Clinical Chemistry, Faculty of Allied Health Science, Chulalongkorn University, Bangkok 10330, Thailand.

Table 1  
Clinical manifestations of malaria<sup>a</sup>.

Presentation	Number	% <sup>b</sup>
Fever	91	96.8
Chills	57	60.6
Headache	27	28.7
Cough	8	8.5
Nausea and vomiting	8	8.5
Flank pain	4	4.3
Oliguria	3	3.2
Diarrhea	3	3.2
Epistaxis	1	1.1
Petechiae	1	1.1
Disorder of menstrual rhythm	1	1.1
Jaundice	1	1.1

<sup>a</sup>One patient may have more than one manifestation.

<sup>b</sup>Percentage of subjects with each manifestation.

features such as petechiae, abnormal menstruation, and jaundice were also found (Table 1).

## DISCUSSION

In Thailand, all four species of malaria parasites that cause human illness have been reported; *Plasmodium falciparum* and *Plasmodium vivax* are predominant (Thimasarn *et al*, 1995). The northern and western regions of Thailand are areas of high prevalence.

Unfortunately, the spread and intensification of multidrug resistant *Plasmodium falciparum*, have taken place over several decades. Because of its dependence on human/vector (mosquito) contact, malaria is considered to be a disease of poverty. Underprivileged people in the rural endemic areas contract malaria, which also causes economic loss and have profound impact on social functioning.

Malaria can present as asymptomatic or mildly symptomatic illness; it may progress rapidly to coma

and death in non-immune patients. Some patients present with chest pain, abdominal pain, joint pains, and diarrhea: symptoms that suggest something other than a viral illness. Nausea, vomiting and a drop in blood pressure on standing or sitting, are common. However, the classic malaria symptoms, fever spikes, chills, and shaking, are still the commonest symptoms (Murphy and Oldfield, 1996).

According to our study, the commonest symptom was fever (96.8%) followed by chills (60.6%) and headaches (28.7%). Our results confirmed the classic presentation of malaria as being fever with chills. Interestingly, most of the patients usually presented with more than one symptom. Some unusual presentations, such as petechiae, abnormal menstruation and jaundice were also found.

The average period before going to visit the physician was similar to that mentioned in a recent report from Basel (Nuesch *et al*, 2000). However, some patients presented after a long period of symptoms. The provision of basic knowledge about malaria to hilltribe communities is an on-going necessity.

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