

# Travelers' malaria among foreigners at the Hospital for Tropical Diseases, Bangkok, Thailand - a 6-year review (2000-2005)

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**Abstract:** We retrospectively examined the charts of travelers admitted to the Hospital for Tropical Diseases, Bangkok, Thailand, with malaria during the years 2000-2005. Twenty-one cases of malaria were identified, of which 12 (57%) were *Plasmodium vivax* infections and 9 (43%) were *P. falciparum* infections. There was one mixed case with vivax and falciparum infection. Only 1 *P. falciparum* case had complications. All cases were successfully treated with standard antimalarial drugs. Only 3 of the 21 cases were thought to be acquired in Thailand, the rest were regarded to be imported.

**Key words:** *Plasmodium vivax*, *Plasmodium falciparum*, travelers' malaria, imported malaria, Thailand

## INTRODUCTION

Malaria is the most important cause of fever in travelers returning from the tropics (Svenson et al., 1995; O'Brien et al., 2002). The exact risk of acquiring malaria in tropical regions is difficult to quantify and depends on a variety of factors including destination, location, travel duration, use of insect repellents, and use of chemoprophylaxis (Loutan, 2003; Askling et al., 2005). Previous studies have established that the risk is higher in travelers to Africa than in travelers to South East Asia (Keystone, 2001; Askling et al., 2005; Freedman et al., 2006). One study estimated at 1:12,254 of the risk of acquiring malaria in Thailand

(Hill et al., 1996). However, the incidence and characteristics of travelers' malaria in Thailand has not been previously studied. We therefore systematically reviewed cases of travelers' malaria seen at the Hospital for Tropical Diseases in Bangkok during the years 2000-2005.

## MATERIALS AND METHODS

We retrospectively reviewed charts from foreign patients seen at the Hospital for Tropical Diseases between the year 2000 and 2005. Records of non-Thai subjects diagnosed with malaria were reviewed and data on presenting symptoms, duration of fever, travel history, species of malaria, initial parasite count, treatment, and outcome were recorded. Initial parasite counts per microlitre blood were calculated by using the number of parasites per 1,000 RBC in a thin film or

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**Table 1.** Characteristics of 21 foreign patients with malaria

Age in years, mean (SD)	35 (13.6)
No. males (%)	21 (100)
Reason for travel	No. (%)
Tourism	10 (47.6)
Business	5 (23.8)
Study	1 (4.8)
Unknown	5 (23.8)
Malaria thought to be acquired in	No. (%)
India	5 (23.8)
Cambodia	3 (14.2)
Thailand	3 (14.2)
Myanmar	2 (9.5)
African country, unspecified	2 (4.7)
Papau New Guinea	1 (4.7)
Malaysia	1 (4.7)
Laos	1 (4.7)
Mozambique	1 (4.7)
Unknown	2 (9.5)

per 200 WBC in a thick film. We excluded immigrant patients from Laos, Myanmar, and Cambodia. They were not considered as true traveler in our study. The country where patients became infected was determined by travel history, particularly by the location of areas visited by the patient in the days and weeks before the onset of symptoms of malaria.

## RESULTS

During the years 2000-2005, a total of 136 febrile foreigners were evaluated at the Hospital for Tropical Diseases in Bangkok. Malaria was diagnosed by the presence of plasmodial parasites on peripheral blood films in 21 patients (15%) (Table 1). All patients were males and the mean age was 35.0 years (SD; 13.6 years). Tourism (47.6%) was the most common reason for travel to Thailand. The majority of cases (18) were imported; only 3 patients (14.3%) were thought to have acquired malaria in Thailand. India appeared to be the most common country of infection (Tables 1, 2). Fever was the presenting symptoms in all cases. Median duration of fever was 3 days (range 1-12 days). Twelve of 21 (57.1%) patients were infected with *P. vivax*, while 9 patients were diagnosed with *P. falciparum* infection. There was one mixed infection

with *P. falciparum* and *P. vivax*. Three out of 12 *P. vivax* patients had history of previous malaria. Median initial parasite count of *P. vivax* cases was 780/ $\mu$ l (range 80-15,000), whereas median initial parasite count of *P. falciparum* cases was 5,000/ $\mu$ l (range 160-800,000).

## Treatment and outcome

Thirteen of the 21 patients (61.9%) required admission to hospital; 10 falciparum and 3 vivax cases. The mean duration of hospitalization was 3 days (SD; 1 day). No deaths occurred in cases with standard antimalarial therapy (Table 3). Only one patient had severe falciparum malaria. He was a 41-year old German male who had trekked in forested areas in Laos 2 weeks before developing fever. On admission, 16% of the patient's RBC contained malaria parasites. This rate of parasitemia is considered severe in non-immunes according to World Health Organization (WHO, 2000). In addition to hyperparasitemia, the patient also had oliguria and his creatinine was rising. He was admitted and treated with intravenous sodium artesunate. Renal function returned to normal with rehydration and no hemodialysis was required. Six days later the patient was a parasitemic, much improved, and was discharged.

## DISCUSSION

The incidence of malaria in Thais is declining. Data from Thai Ministry of Public Ministry, in 2002 (fiscal year), there were 47,948 new malaria cases, which declined to 28,477 in 2005. The risks of acquiring malaria in Thailand are limited to a few well demarcated areas mainly along the mountainous border regions. The policy of the Thai Ministry of Public Health is not to recommend antimalarial chemoprophylaxis, because of very low risks for travelers and prevalence of multi-drug-resistant strains of *P. falciparum*. WHO and US Centers for Disease Control (CDC) advise that only travelers to high risk areas of Thailand should consider antimalarial prophylaxis (WHO, 2005; Centers for Disease Control, 2005).

Many details about travelers' malaria in Thailand are difficult to know with certainty. Some travelers

**Table 2.** Details of 21 cases of travelers' malaria at the Hospital for Tropical Diseases, Bangkok

No.	Year	Age	Nationality	Recent Travel History	Country where malaria was thought to be acquired	Reason for Travel	Type of Malaria	Initial Parasite Count (/µl)
1	2000	34	PNG	Just arrived Thailand from PNG	PNG	Business	<i>P. falciparum</i>	30,000
2	2000	26	USA	Traveling in Cambodia, arrived Thailand 7 days ago	Cambodia	Tourism	<i>P. falciparum</i>	1,800
3	2000	23	England	Traveling in Cambodia, arrived Thailand 7 days ago	Cambodia	Tourism	<i>P. vivax</i>	640
4	2000	48	India	Just arrived Thailand from India	India	Unknown	<i>P. vivax</i>	15,000
5	2000	26	India	Just arrived Thailand from India	India	Business	<i>P. vivax</i>	440
6	2001	38	Austria	Travel in Koh Chang, Thailand 2 wk ago	Thailand	Tourism	<i>P. falciparum</i>	N/A
7	2001	16	Nepal	N/A	N/A	Unknown	<i>P. falciparum</i>	200,000
8	2002	37	Africa	Just arrived Thailand from Africa	African country, unspecified	Tourism	<i>P. falciparum</i>	320
9	2002	38	Australia	Just arrived Thailand from Africa	African country, unspecified	Tourism	<i>P. falciparum</i>	360
10	2003	25	India	Came from India 2 wks ago	India	Unknown	<i>P. vivax</i>	1,920
11	2003	28	France	N/A	N/A	Unknown	<i>P. vivax</i>	480
12	2003	63	USA	Trekking in Myanmar	Burma	Business	<i>P. vivax</i>	15,000
13	2003	41	Germany	Trekking in Laos 2 weeks ago	Laos	Tourism	<i>P. falciparum</i> (Severe)	800,000
14	2004	24	USA	Came from Malaysia	Malaysia	Tourism	<i>P. vivax</i>	80
15	2004	40	Germany	Travel in Trat, Thailand 1.5 mo ago	Thailand	Unknown	<i>P. vivax</i>	5,000
16	2004	5	Malawi	Stayed and traveled around Thailand for 2 years	Thailand	Study	<i>P. vivax</i>	920
17	2004	48	Mozambique	Came from Mozambique	Mozambique	Business	<i>P. falciparum</i>	25,000
18	2004	43	Austria	Came from Cambodia, arrived Thailand 2 weeks ago	Cambodia	Tourism	<i>P. falciparum</i>	10,000
19	2004	63	USA	Came from Burma 3 mo	Burma	Business	Mixed Infection	Pf5,000, Pv240
20	2005	37	India	Came from India 10 days ago	India	Tourism	<i>P. falciparum</i>	160
21	2005	38	India	Came from India 10 days ago	India	Tourism	<i>P. falciparum</i>	400

**Table 3.** Treatment regimens for malaria***Plasmodium falciparum* malaria (9 cases)**

Quinine (300 mg) 2 tab. t.i.d. x 7 days + tetracycline (250 mg) 1 tab q 6 hr x 7 days  
 Artesunate total dose 600 mg + mefloquine total dose 1,250 mg

***Plasmodium vivax* malaria (11 cases)**

Chloroquine (250 mg) 4, 2, 2, 2 tab + primaquine (15 mg) 1 tab x 14 days

**Mixed *P. falciparum* and *P. vivax* (1 case)**

Artesunate total dose 600 mg + mefloquine total dose 1,250 mg + primaquine 14 days

have visited several different countries and it is not possible to be sure of the country where malaria was acquired. Other travelers are only diagnosed with malaria after their return home, so data from travelers found to have malaria in Thailand will underestimate the total number of cases of travelers' malaria. Malaria remains an important cause of fever in travelers returning from the tropics. The incidences of malaria in travelers vary according to studies. It was reported from a tropical center in France that as high as 75% of febrile cases were caused by malaria (Parola et al., 2005). The most recent study has shown that 13% of febrile travelers who returned from South East Asia were caused by malaria (Freedman et al., 2006).

In our study, 15% of febrile travelers presenting to our hospital had malaria and only 14% of these cases were thought to have been acquired in Thailand. More than half of the malaria cases were due to *P. vivax*, severe malaria was uncommon, and response to treatment was good. No mortality was found in our series. Out of 21 patients, 5 (23.8% ) were from India and all of them were thought to have acquired their infections in that country. This may be due to the widespread areas of malaria risk in India. WHO estimated that 95% of Indian population lived in malaria risk areas (WHO, 2000). However, the trend of malaria cases in India slowly declined. There were approximately 2 million new malaria cases in India each year. So the febrile Indian travelers should be screened for malaria even when they travel to a non-endemic country, since they can acquire malaria in their home country. Apart from Indian patients, in our series, we have 3 malaria cases from Papua New Guinea, Mozambique, and an African country that were thought to have acquired malaria in their home country and get sick in Bangkok. With the increase in international travels, travelers' malaria will be more important. Physicians should rule out malaria in all febrile patients who have been traveling or came from endemic areas of malaria.

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