

# Clinical Features of Malaria in Orang Asli Population in Pos Piah, Malaysia

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## Summary

A malaria survey was conducted to examine the presence of common clinical features of malaria in individuals living in an endemic area of malaria. The overall infection rate was 11.0% with 7.5% and 3.5% infected with *Plasmodium vivax* and *Plasmodium falciparum* respectively. The mean parasitaemia level of both species was 2905.9 parasites /  $\mu$ l blood, with the mean parasitaemia level of *P. vivax* and *P. falciparum* at 682.7 parasites /  $\mu$ l blood and 6981.7 parasites /  $\mu$ l blood respectively. The infection rates were higher in the younger age group. Hepatomegaly, hepatosplenomegaly and clinical anaemia were significantly associated with malaria. None of the patients were febrile. In conclusion, in low endemic areas, the presence of clinical anaemia, hepatomegaly and hepatosplenomegaly in afebrile individuals could be considered as useful criteria for the presence of asymptomatic parasitaemia. It is important to carry out laboratory diagnostic investigations, to ensure all the asymptomatic parasitaemia which act as reservoirs are detected and treated.

**Key Words:** Malaria, *Plasmodium falciparum*, *Plasmodium vivax*, Clinical features

## Introduction

The main clinical feature in a typical case of malaria is paroxysms of fever. However, in areas where malaria transmission is lower, the proportion of individuals who present with fever, but do not have malaria, is likely to be high. On the other hand, in hyperendemic areas, the main clinical feature is usually altered by the use of prophylactic drugs or an acquisition of immunity resulting from repeated exposures to

infection. In these areas, malaria surveys will usually disclose many individuals with parasites in the blood but with no or few clinical symptoms of malaria. Therefore the diagnosis of malaria in the absence of microscopic blood examination is difficult.

This present study was conducted in an endemic area of malaria. The objectives of this study were to determine the prevalence of malaria and to examine the presence of classical clinical features of malaria (fever, clinical anaemia and splenomegaly) among Orang Asli living in Pos Piah.

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## Materials and Methods

A malaria survey was conducted in an Orang Asli population in Pos Piah, Sungai Siput Utara, Perak. Pos Piah is a new resettlement area for the Orang Asli community from the Temiar group. It is located in a hilly region about 60 km from the town of Sungai Siput, Perak. It consists of 4 villages, Gentes, Kembok, Piah and Teras. The Ministry of Health provides the health services to the community. Most of the health activities are associated with malaria control and provision of primary health care. Demographic data of the population in Pos Piah were collected by means of house-to-house survey prior the to study proper. All residents in the villages were invited to participate.

A total of 356 individuals (178 males and 178 females) were physically examined for the presence of fever, clinical anaemia, splenomegaly and hepatomegaly. Thin and thick blood smears were examined to determine the presence of malaria parasites and the parasitaemia level. Data was analysed using SPSS for Windows<sup>1</sup>.

## Results

A total of 356 subjects between 4 months - 72 years old (178 males and 178 females) participated in this study. Blood examination for the detection of malaria was only possible in 310 (87.1%) individuals. Thirty four (11.0%) malaria cases were detected from the 310 individuals. The parasite rates of infections with *P. vivax* and *P. falciparum* were 7.1% and 3.9% respectively. The parasitaemia levels ranged from a few parasites to 20,000 parasites /  $\mu$ l blood, with a mean parasitaemia level of 2905.9 parasites /  $\mu$ l blood. The mean parasitaemia level for *P. vivax* and *P. falciparum* were 682.7 parasites /  $\mu$ l blood and 6981.7 parasites /  $\mu$ l blood respectively.

The distribution of malaria cases according to species, age and gender are shown in Table I. The highest rate of infection in this population was in the 0 - 10 years age group (19.0%) with a

**Table I**  
**Malaria Parasite Rates in Orang Asli Population in Pos Piah, Perak according to Age, Gender and Species of Plasmodium**

Age-group (years)	Number infected	<i>P. falciparum</i> (%)	<i>P. vivax</i> (%)	Total (%)
0 - 10	24	4.8	14.2	19.0
11 - 20	7	6.0	4.4	10.4
21 - 30	2	2.0	2.0	4.1
31 - 40	0	0.0	0.0	0.0
>40	1	3.2	0.0	3.2
<b>Gender</b>				
Males	22	4.5	9.7	14.2
Females	12	3.2	4.5	7.7

progressive decline from then onwards. This pattern was seen in both species of malaria. The infection rate was significantly higher in children (<12 years old) compared to the older age group ( $X^2 = 22.71$ ,  $p=0.0000$ ). However there was no significant difference of the infection rate between gender ( $X^2 = 3.30$ ,  $p=0.069$ ).

Hepatomegaly, hepatosplenomegaly and clinical anaemia were significantly associated with malaria with  $p$  value of 0.0052, 0.00358 and 0.035 respectively. However splenomegaly was not significantly associated with malaria ( $p=0.133$ ).

## Discussion

About 10.0% of malaria cases in Malaysia were reported among the Orang Asli<sup>2</sup>. Pos Piah, a new resettlement area for an Orang Asli community is endemic for malaria. In this community, higher parasite rates were observed in the younger age groups, with progressive decline with age. A similar finding was also observed in an Orang Asli community in Sungai Lui<sup>3</sup>. This pattern of malaria distribution in the various age groups is attributed to the high susceptibility of the younger age groups to malaria and the high immunity level to malaria in the older age groups.

Assessment of the clinical signs, particularly the presence of fever or history of fever, forms the basis of malaria diagnosis in malaria endemic areas. In fact, a history of fever is used as a criteria for presumptive treatment of subjects living in malaria endemic areas during surveillance activities of the malaria control program. In our study site, and in most areas in Malaysia, the incidence of malaria is low. A high proportion of individuals living in such areas, who present with fever do not have malaria. On the other hand, individuals infected with malaria may not present with fever as a result of prophylactic treatment or acquisition of immunity. In this study, none of the individuals infected by malaria was febrile. Low parasitaemia level, high prevalence of *P. vivax* infection and acquisition of immunity may explain this situation. The use of fever as a clinical criterion in diagnosing malaria in this community may result in undiagnosed malaria and this would increase the morbidity and also the transmission of malaria. Previous studies in Orang Asli also revealed no significant association between fever and malaria infection<sup>4,5</sup>. Studies carried out in Africa revealed that clinical criteria were too non-specific to serve as a tool in diagnosing malaria in semi-immune population<sup>6,7,8</sup>.

This study however, revealed significant association between malaria and other clinical features of malaria such as hepatomegaly, hepatosplenomegaly and clinical anaemia. However, there was no significant association between malaria infections with splenomegaly.

Another study in an Orang Asli community, also revealed no significant association between malaria and splenomegaly<sup>5</sup>. On the other hand, a study in a low transmission area of malaria in Thailand showed that fever ( $\geq 38^{\circ}\text{C}$ ), clinical anaemia, splenomegaly and hepatomegaly were associated with a final diagnosis of malaria<sup>9</sup>. However, none of these signs alone or in combination proved a good predictor of malaria<sup>9</sup>.

In conclusion, in low endemic areas, the presence of clinical anaemia, hepatomegaly and hepatosplenomegaly in afebrile individuals may be considered as useful criteria to detect asymptomatic patients. However, microscopic detection of malaria parasites is still the most reliable method to confirm malaria. In malaria control programs, whenever possible it is important to carry out this laboratory diagnosis, to ensure all the individuals with asymptomatic parasitaemia, who act as reservoirs, are treated.

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