SITUATION OF MALARIA IN SMUTSAKHON HOSPITAL CLINICAL ANALYSIS OF 200 CASES

Charnchai Sukrasmita

Smutsakhon Hospital

ABSTRACT :

Sukrasmita C. Situation of Malaria in Smutsakhon Hospital. (Region 7 Medical Journal 1996 ; 3 : 373-381).

Department of Medicine, Smutsakhon Hospital, Smutsakhon, Thailand.

For 200 cases study in Smutsakhon hospital there were Malaria falciparum 137 cases (68.5%), most of them were foreigner 99 cases(49.5%) [Mon 91 cases(45.5%), Myanmar 4 cases (2%), Kareang 4 cases(2%)]. There were only 38 cases(19%) Thai. As for the Malaria vivax of 50 cases(25%) mostly were foreigner 32 cases(16%) [Mon 28 cases(14%), Myanmar 2 cases(1%), Kareang 1 case(0.5%), Indian 1 case(0.5%)], Thai 18 cases(9%). Mixed infection : P. falc. + P.v. 9 cases(4.5%), the foreigner 6 cases (3%) [Mon 5 cases(2.5%), Kareang 1 case(0.5%)], Thai 3 cases (1.5%) and cerebral malaria 4 cases(2%), Mon 3 cases(1.5%) ,Thai 1 case(0.5%). Most of them, age incidence were 16-30 yrs old, working age, which travelled from Thai-Myanma border as the labour. Male : Female = 5 : 1 and the infection occurred in the month during May to August or Rainy season.

Drug used for treatment for P.falc. : Quinine 55 cases, Quinine+ Tetracycline 66 cases, Quinine+Primaquine 7 cases, Quinine+Tetracycline+ Primaquine 5 cases, Quinine+Chloroquine + Tetracycline 4 cases, while for P.v. : Chloroquine 1 case, Chloroquine+Primaquine 38 cases, Quinine + Primaquine 8 cases, Quinine + Tetracycline 1 cases. These treatment showed that Quinine + Tetracycline was more effective for P.falc. than the others while Chloroquine + Primaquine was the better for P.v..

Malaria is the infection caused by the parasite, Plasmodium,[1,4] which transmitted by the bite of Anopheles mosquitoes (A. minimus, A. dirus, A. maculatus, A. sandaicus, in Thailand.)[2] In the central part of Thailand,[2,3] (Bangkok, Nonthburi, Angthong, Ayuthaya, Nakhonpathom, Patumthani, Singhaburi, Smutpragan, Smutsakhon and Smutsongkram) these mosquitoes are not found, so Smutsakhon province is the land free from malarial infection for several years[2,3]

In Smutsakhon hospital, 200 cases of malaria were admitted for treatment during 1992-1994, in the Department of Medicine, even Smutsakhon is the land that free from malaria.[2,3] So malarial infection were studied for it's situation of epidemiology, race, sex, occupation, age, species of Plasmodium, severity, duration of infection and drug administration.

Material and Method

From October 1992 to September 1994, two hundred cases of malaria in the Department of Medicine, Smutsakhon hospital were studied. All of them were admitted and diagnosed as malarial infection by clinical and blood examination positive for Plasmodium.

The study included

1. The patients : were Mon 127 cases, Thai 60 cases, Myanma 6 cases, Kareange 6 cases, and Indian 1 case, ages between 1-50 years old, sex : male 167 cases, female 33 cases. Their occupation were studied too.

2. The parasites ; 2 species : Plasmodium falciparum and Plasmodium vivax were studied for epidemiology and it's severity.

3. The drugs administration : Quinine, Primaquine, Chloroquine (antimalarial drugs) and Tetracycline (antimicrobial drug).

Result

1. The patients

1.1 Age

The more common age incidence was 11-40 years old, and the most common was 16-30 years old, the working age, as showed in the Table 1.

1.2 Occupations.

There were many occupations in the study, such as, Labour, Official servant, Merchant. Labours were the common occupation that infected. As showed in Table 2.

2. The Parasite.

2.1 Species.

In Smutsakhon hospital it was found 2 species of Plasmodium (Plasmodium falciparum, Plasmodium vivax) were found, by blood examination were positive. The most of the patients infected by one parasite but some infected by both parasites. Plasmodium falciparum (P. falc.) was found more than Plasmodium vivax (P.v.) as showed in the Table 3.

2.2 Season of infection.

The infection was found every month of the year. But was often found during Feb. to Aug. as showed in the Fig. 1.

2.3 Severity of malarial infection compared between the species.

2.3.1 Studying the fever or temper-

ature of the patients. P. falc. caused higher fever than P.v. as shown in Table 4.

2.3.2 Studying the severity by duration of hospitalization.

The patients infected with P. falc. stayed in the hospital longer than infected with P.v. as shown in Fig. 2.

3. Drugs administration

There are 4 drugs used for malarial infection in Smutsakhon hospital, Quinine, Chloroquine, Primaquine which are Tetracycline were administered, some cases were treated only single drug as Quinine for P. falc. and Chloroquine for P.v. respectively, in the case which were found in gemetocyte stage, Primaquine was combined for P. falc.

3.1 Method of drugs administration.

3.1.1 Single drug.

Quinine = 1, Chloroquine = 2

3.1.2 Combined drugs.

Quinine + Primaquine = 3

Chloroquine + Primaquine = 4

Quinine + Tetracycline = 5

Quinine + Primaquine + Tetracycline = 6

Chloroquine + Primaquine + Tetracycline = 7

Quinine + Chloroquine + Tetracycline = 8

The result as showed in the Table 5.

P. falc. infection were treated by combined drugs, Quinine + Tetracycline in 66 cases, and quinine alone in 55 cases as shown in the Table 5 38 cases of P.v. infection were treated by combined drugs, chloroquine + primaquine, as showed in the Table 5.

3.2. Duration of admission days compared with drugs administrations. The result was shown in Table 5.

The result ; Some of P. falc. infections were treated by single drug, Quinine only, 2 cases improved (both clinical symptom and blood examination were negative for Plasmoduim in 1 and 2 hospitalization days, 13 cases in 3 days, 12 cases in 4 days, 11 cases in 5 days and other in the Table 5. Quinine + Tetracycline, combined drugs,there were 4 cases improved within 1 day, 7 cases in 2 days, 12 ceses in 3 days, 16 cases in 4 days and 6 cases in 5 days and the other as in table.

P.v. infections were treated by combined drugs, Chloroquine + Tetracycline, 13 cases were improved in 1 day, 11 cases in 2 days and the other as showed in the table 5.

P. falc. were treated by Quinine + Tetracycline in 66 cases, the patients improved from the infection within 4 days for 39 cases while treated by single drug Quinine, they improved within 4 days for 29 cases with Quinine alone improved within 4 day.

Discussion

In 1884, Manson[1] took hypotheses that Anopheles is the the vector of malaria. In 1887 in india, Ross[1] proved that the parasites (Plasmodium) had a completly life cycle in Anopheles.

Now we knowed that the vector of this parasite, Plasmodium, is the mosquitoes, Anopheles.[4] They are, A. minimus, A. dirus, A. maculatus, A. sandaicus, A. aconitus, A. philippinensis, and A.

camprestis. In Thailand there are only five species (A.dirus, A.minimus, A. maculatus, are most important and the less important A.sandaicus and A. conitus), which are not founded in the central area of Thailand, Smutsakhon is the land free from malaria. But there are A. conitus, A. philippinensis, and A. camprestis at Thai-cambodia[5] and Thai-Myanmar border,[6] whith is high risk of malarial infection. So this area are not free from malaria especially Kanjanaburi province.

In Smutsakhon hospital, there were 200 cases of malaria, most of them occurred in Mon

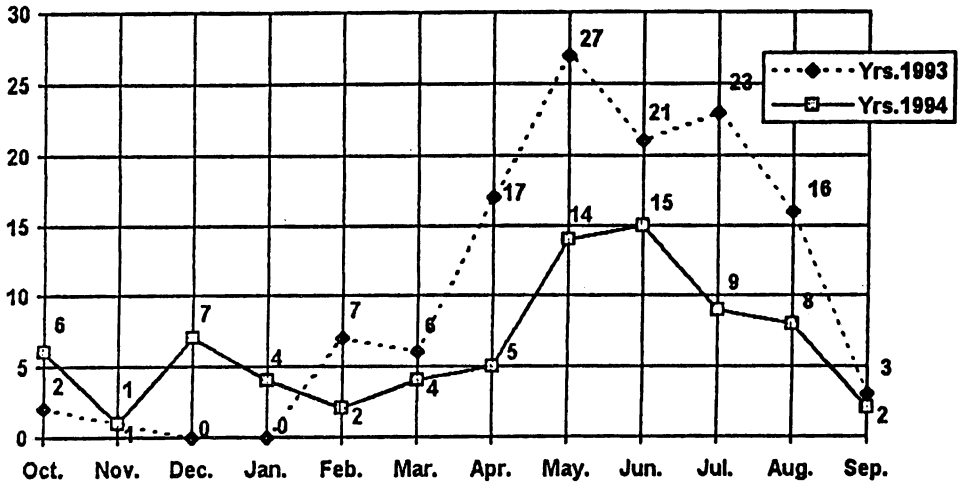

Fig. 1 Showed the season of Malarial infection.

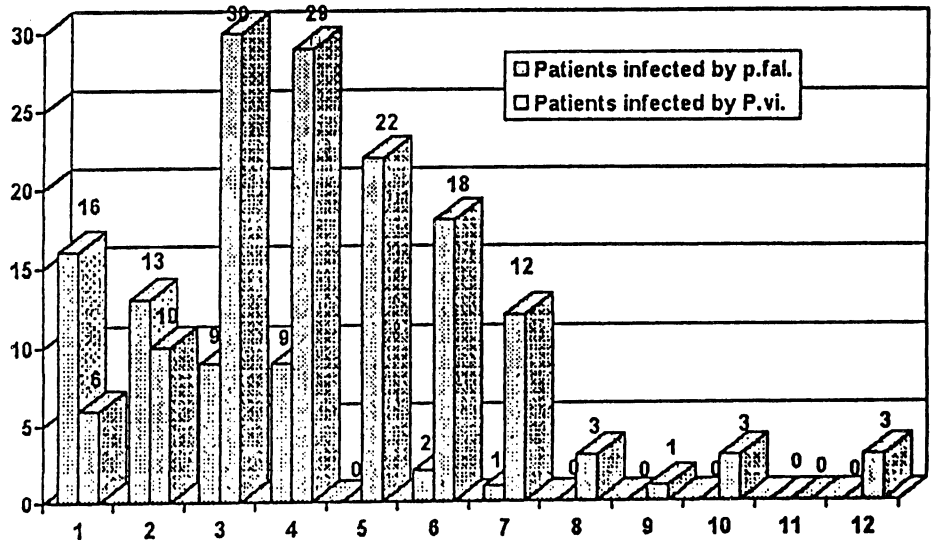

Fig. 2 Duration of hospitalization.

For 4 days ; P. falc. = 29 cases, P.v. = 9 cases.

5 days ; P. falc. = 22 cases, P.v. = 0 cases.

> 7 days ; P. falc. = 10 cases, while P.v. = 0 case.

Table 1 Showed relation between race, sex and age.

Race, Sex / Age	0-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	#	Total
Mon											
Male	4	4	40	24	13	5	8	2	1	2	103
Female.	1	1	9	5	4	3	1	-	-	-	24
Thai											
Male	-	6	10	17	10	4	3	3	-	-	53
Female	1	-	1	3	1	-	-	1	-	-	7
Kareang											
Male	-	-	3	2	-	-	-	-	-	-	5
Female	-	-	1	-	-	-	-	-	-	-	1
Mayanmar											
Male	-	-	3	2	-	-	-	-	-	-	5
Female	-	-	1	-	-	-	-	-	-	-	1
Indian											
Male	-	-	-	-	1	-	-	-	-	-	1
Total	6	11	68	53	29	12	12	6	1	2	200

Race : Mon 127, Thai 60, Kareang 6, Myanmar 6 and Indian 1
Sex : Male 167, female 33
Age : There were many cases, 11-40 ; most cases, 16-30 yrs old
: No record of age

Table 2 Showed to relationship between race, sex, and their occupation.

Race, Sex / Occupation	Lb.	Hh.	Hk.	Fm.	Os.	Mc.	Fs.	Oth.	Total
Mon									
Male	84	3	4	-	-	-	3	9	103
Female	17	2	3	-	-	1	-	1	24
Thai									
Male	29	3	4	1	6	3	4	3	53
Female	6	1	-	-	-	-	-	-	7
Kareang									
Male	5	-	-	-	-	-	-	-	5
Female	-	-	1	-	-	-	-	-	1
Myanmar									
Male	5	-	-	-	-	-	-	-	5
Female	-	-	1	-	-	-	-	-	1
Indian									
Male	-	-	-	-	-	1	-	-	1
Total 146	9	13	1	6	5	7	13	200	

Table 3 Showed Plasmodium species infected the patients.

Species / Race, Sex	Mon		Thai		Kareang		Maynmar		Indian	Total
	Male	Female	Male	Female	Male	Female	Male	Female	Male.	
P. falc.	75	16	33	5	3	1	3	1	-	137
P.v.	22	6	17	1	1	-	2	-	1	50
P. falc + v.	4	1	2	1	1	-	-	-	-	9
CM.	2	1	1	-	-	-	-	-	-	4

Table 4 Comparison of fever in patients infected with P. falc and P.v.

Species / Temperatureoc	37-38	38.1-39	39.1-40	40.1-41
P. falc.	13	36	56	32
P.v.	12	9	22	9
P [falc. + Pv.]	-	2	7	-
CM.	-	1	-	3

Temparature

> 38 °c : P. falc. = 36 case, P.v. = 9 cases

> 39 °c : P. falc. = 56 cases, P.v. = 22 cases

> 40 °c : P. falc. = 32 cases, P.v. = 9 caeses. CM. = 3 cases

Table 5 Showed relationship between drugs used and duration of hospitalization day for Plasmodium species.

Drugs	Plasmodium	Days												
		1	2	3	4	5	6	7	8	9	10	11	12	Total
1	P. falc.	2	2	13	12	11	7	5	1	1	1	-	-	55
	P.v.	-	-	-	-	-	-	-	-	-	-	-	-	-
2	P. falc.	-	-	-	-	-	-	-	-	-	-	-	-	-
	P.v.	1	-	-	-	-	-	-	-	-	-	-	-	1

Table 5 Showed relationship between drugs used and duration of hospitalization day for Plasmodium species.

Drugs	Plasmodium	Days												
		1	2	3	4	5	6	7	8	9	10	11	12	Total
3	P. falc.	-	1	4	-	-	1	-	-	-	1	-	-	7
	P.v.	1	2	1	3	-	-	1	-	-	-	-	-	8
4	P. falc.	-	-	-	-	-	-	-	-	-	-	-	-	
	P.v.	13	11	8	4	-	2	-	-	-	-	-	-	38
5	P. falc.	4	7	12	16	6	10	6	1	-	1	-	3	66
	P.v.	1	-	-	-	-	-	-	-	-	-	-	-	1
6	P. falc.	-	-	-	-	4	-	-	1	-	-	-	-	5
	P.v.	-	-	-	-	-	-	-	-	-	-	-	-	-
7	P. falc.	-	-	-	-	-	-	-	-	-	-	-	-	-
	P.v.	-	-	-	1	-	-	-	-	-	-	-	-	1
8	P. falc.	-	-	1	1	1	-	-	-	-	-	-	-	3
	P.v.	-	-	-	1	-	-	-	-	-	-	-	-	1

people, the second were Thai, some Myanmar, Kareang and only one was Indian, male was more than female, or 5 : 1 as the other studies[7,8] Labourer were the most common ocupation found 146 cases (83%), age incidence were 11-40 years old,[7] most of them were 16-30 years old which was working age.

The Most of the foreigner and some of Thai were travellers from Thai-Myanmar border, the high risk area of malaria[5,6] The travellers were high risk of infected and transmitted malaria to Smutsakhon people. The most travellers were Mon from Sungklaburi, Kanchanaburi, working as labourers. Thai travellers traveled to that border as the tourist and some as labourers. When they came to the central part of Thailand, they brought the malaria with them. So Smutsakhon which is in central part of Thailand, is not free from malaria as in the pass.

There are 4 species of parasites caused malarial infection,They are Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae and Plasmodium ovale. In Thailand the most common is P. falc,[4,6,11] the second is P.v., some P.m. (Plasmodium malaraie). The lowest common is P. ovale (Plasmodium ovale) which is found just a little now.

About time or season of infection occured nearly all yearround. In Smutsakhon hospital the infected cases were found from February to August, mostly in April to August, which is the rainy season. Malaria was found in these months,as in other studied (May to August).

In this study there were 2 species, P. falc.

and P.v. that caused malarial infection. Among these two hundred cases of the patients, ther were 137 cases infected with P. falc. and 50 cases with P.v., the proportion is 2 : 1 neary 4 : 1[11,12] and besides single infection some infected with mixed infection, P. falc. and P.v. The severity of P. falc. is more than P.v,[4,5,13] it caused higher fever, more rolonged hospitalization, developed cerebral malaria and fatal. There were 3 cases in Smutsakhon hospital died by cerebral malaria. So P. falc. is the more infected and coused more severity than P.v. in Smutsakhon hospital as in other report.[12]

In this study there were 3 antimalarial drugs,[14] Quinine, Chloroquine, Rimaquine and 1 antimicromial drug, Tetracycline were used for treating malarial infection.

Quinine was used to treat P. falc. infection, Chloroquine to treated P.v. as single drug. In the cases that gametocyte stage were detected in blood smear, Rimaquine was added as combined drugs for P. falc. etracycline combined with Quinine was treated in P. falc. infection in many cases in this study, the prognosis is better than Quinine only, the same as in other studies.

Cerebral malaria, a severe stage of P. falc. infection, was treated by single drug, Quinine only, its prognosis is not good. In this study 3 cases were dead when treated by Quinine while 1 case was improved when treated by Quinine combined with Tetracycline.

As single drug therapy, some patient did not improved for a few duration of hospitalization day, especialy P. falc. In these case, Tetracycline was used for combined drug with Quinine improved and shorter the duration of ospitalization day than the single drug. So combined drug, Quinine and Tetracycline is the proper drug administration, the same as other studies.[3,14]

The situation of Malaria in Smutsakhon hospital is imported malaria, by the travellers from endemic area to free from malaria area, Smutsakhon, from Thai-Myanma, as labourers were Mon, Thai, Kareang, Myanmar and Indian. The parasite, P. falc. caused the infection and severity of infection more than P.v. and had poor prognosis, caused cerebral malaria. As for the treatment, Quinine + Tetracycline as combined drugs was more effective than Quinine alone, Prognosis in P.v. is good and hospitalized day was only few day and most were treated by Chloroquine + Primaquin and Primaquine was drug used to killed gametocite in P. falc.

References

1. Hruareeyasuvan A, Bunnag D, Harinasuta T. Malaria. Textbook of Tropical Medicine 1990. 1st ed. Bangkok : Ruomtasande, 1990 : 19-153.
2. Pinichpongse S, Ratanaritikul M. A study on malarial vecters in the central part of Thailand. J Med Assoc Thai 1968 ; 51 : 61-73.
3. Chongsuphajaisiddhi T. Malaria. Preventive Medicine 1989 ; 1 : 453-57.
4. Tusanaswang C. Malaria.Text Book of Communicable diseases 1st ed. Bangkok : Chulalongkorn University, 1989 : 300-32.
5. Beherens RH, Bradley DJ. Malarial prophylaxis. Medicine digest 1994 ; 12 : 16-21.
6. Thimasarn K. Present malarial condition in Thailand. J of Malaria 1994 ; 29 : 163-65.

7. Tachasena V, Kuldilokchai D,Ungulanond P. The study of Efficacy of Antimalarial drugs in Nan Hospital. Bulletin of the Department of Medical Service 1989 ; 114 : 589-96.
8. Thimasarn K, Malaria 1995. Present and the future. J of Malaria 1995 ; 30 : 55-57.
9. Vichitukka S. General condition of Malaria. J of Malaria 1994 ; 29 : 217-19.
10. Thimasarn K. Malarial infection in Thailand. J of Malaria 1994 ; 29 : 57-59.
11. Smutsakhon sanitation Office reported.1993-1995.
12. Pinichpongse S, Doberstyn EB, Cullen JR, Yisunsri L, Thongsombun Y, Thimasarn K. An evaluation of five regimens for the out patients therapy of Falciparum malaria in Thailand 1980-81. Bull WHO 1982 ; 60 : 907-12.
13. Areekul S, Wilairatana, Viravan C. Salmonella infection in patient with Plasmodium falciparum malaria. Siriraj Hosp Gaz 1995 ; 47 : 441-44.
14. Chongsuphajaisiddha T. Antimicrobe Agents. J Infect Dis 1985 ; 2 : 151-59.
15. Tamsupapong S.Cerebral malaria with cerebral haemorrhage. Prapokklao Hosp Clin Med Educat Center 1992 ; 9 : 142-46.