J Vect Borne Dis 40, September & December 2003, pp 109–111

Hospital based study of malaria in Ratnagiri district, Maharashtra

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Key words Malaria – *P. falciparum* – *P. vivax* – slide positivity

Malaria is a well-known disease and it continues to be a major public health problem at the start of new millennium. The problem is persistent not only amongst the city dwellers but also amongst the rural population. The problem in rural India is that the settlements are difficult to approach, road and transport facilities are minimal and health care facilities are scarce. Therefore, people visit a hospital only if the illness is prolonged and there is no response to the primary line of treatment. This report deals with malaria cases reoprted at a secondary care level hospital in Ratnagiri district of Maharashtra state, India. In this district the population is relatively scarce and villages are spread over large distances. Each village is divided into many hamlets, each with 25 to 50 huts. Commonly the males of the region are out in the city for employment and women, children and geriatric population stay back in the villages. This results in constant inflow and outflow of population, which might be leading to spread of malaria in both directions.

The present reoprt presents the gender and age wise distribution of malaria cases, clinical presentation of the patients and the treatment modality used during the study period—May 1999 to April 2000. The study also looked at the number of patients presenting with cerebral malaria, with liver and/or spleen enlargement, the seasonal trend of the disease and the number of deaths amongst the study group population.

All patients who attended the hospital for various ailments (including OPD and indoor patients) were considered as the hospital population during the study period. Peripheral blood was collected and examined for malarial parasite, of any of the patients who had clinical features suggestive of malaria—history of fever with chills and rigors, enlargement of spleen, secondary anaemia, etc. Both thick and thin blood films were prepared and stained by Ramnowski's method. Leishman's stain was used for slide preparation and reporting was done by the hospital pathologist. The detailed medical records of all those who were positive for malaria parasite were maintained. The species of the parasite and also the stages in which the parasite were seen also noted. Slide positive rate (SPR), and slide falciparum rate (SfR) were calculated using the standard formulae.

A total of 17,983 patients attended this hospital for various ailments during the study period and of these 448 patients who had clinical history suggestive of malaria were examined for malaria parasites. Out of the 448 slides examined, 44 slides were positive for malaria parasites (26 *P. falciparum* and 18 *P. vivax*). The SPR and the SfR were 9.82 and 5.8% respective-

ly. Two *P. vivax* patients and 21 *P. falciparum* malaria patients had gametocytes in their peripheral blood.

Age and gender wise distribution of study group and malaria positive patients are shown in Table 1 and Fig.1. Of the 44 patients tested for positive malaria parasites, 26 males and 18 were females. The gender ratio is 1.44 : 1. Males are more exposed to the risk of acquiring malaria because of the outdoor life they lead. Secondly, females in India are usually better clothed than males.The mean age of study group is 30.54 years with 35.27% of patients belonging to 20 to 40 years age group and the mean age of malaria positive patients is 30.95 years with 40.9% patients in the same years age group. About five patients presented with clinical features suggestive of cerebral ma-

Table 1. Age wise distribution of patients and malaria positive cases (according epidemiological age groups)

Age	No. of patients (study group)		No. of patients (malaria positives)	
	Males	Females	Males	Females
0–11months	14	6	1	0
12–23 months	12	10	1	1
2–4 years	8	8	1	1
5–9 years	16	8	2	1
10–14 years	16	10	3	2
> 14 years	206	134	18	13
Total	448		44	

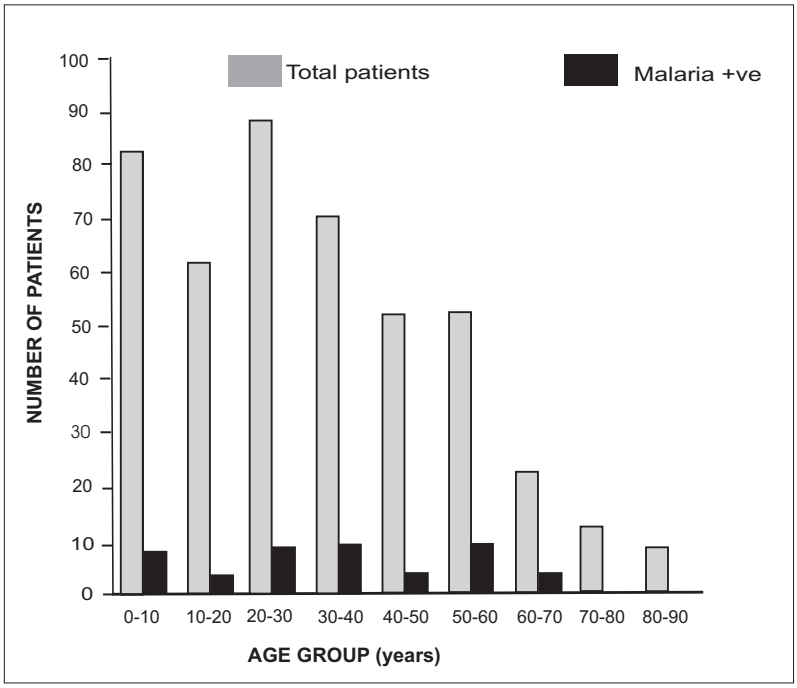

Fig. 1: Age wise distribution of malaria patients

laria such as hyperpyrexia, convulsions, unconsciousness, severe pallor, jaundice with or without splenomegaly, neck rigidity was absent in all of them and they were treated with quinine 10 mg/kg (iv) as an infusion over 4 to 8 h, thrice daily. The patients were monitored for tinnitus, nystagmus, ECG and glucose levels. The patients were later shifted to oral therapy. Three patients amongst the above five were malaria positive. Two patients had hepatomegaly and two had hepatosplenomegaly. There was no death amongst these patients.Of the 44 malaria positive patients 3 had hepatomegaly, three had splenomegaly and three had hepatosplenomegaly. All the 44 malaria positive patients received antimalarials like chloroquine, quinine (quinolone derivative), primaquine and mefloquine as per the drug policy. Of the 44 patients, 41 patients received treatment based on clinical features and slide positivity was confirmed later,while three patients received treatment after slide positivity confirmation. No death was reported in malaria patients.

Out of 44 cases, maximum number of cases 32 (72.73%) were reported in this hospital during a period of five months (April to August). Malaria, a seasonal disease, in most parts of India, the maximal prevalence is from July to November. Good rainfall, relative humidity of 60% and temperature between 20 and 30^{o}C favour the spread of malaria. According to a study conducted by Bonnlander *et al*[1] at Central Haiti's Schweitzer hospital peak case incidence occurred in the November to January period, a few months after the rainy season[1]. However, in the study area, because of hilly terrain the mosquito breeding probably gets washed away as the water flows at high speed and after the monsoon the breeding sites become stable and favourable for mosquito proliferation.

In India, about 70% of the infections are reported to be due to *P. vivax*, 25–30% due to *P. falciparum*, 4–8% due to mixed infection and 1% due to *P. malariae*[2]. Contrary to this in the present study high number of *P. falciparum* cases (59.09%) were reported. Anand *et al*[3] in a study at a secondary level hospital in northern India noted that of the 41 cases 35 were positive for *P. vivax* and six were positive for *P. falciparum.* In a retrospective study conducted by Sidhu *et al*[4] in Malaysia, a total of 64 cases were recorded, 50% of which were due to *P. falciparum*, 40.6% were due to *P. vivax*, 6.2% due to *P. malariae* and 3.1% due to mixed infection of *P. falciparum* and *P. vivax*. High number of *P. falciparum* infections recorded in the present study may be due to their prolonged illness and severity of the disease who were referred/admitted to a secondary care hospital from the adjoining areas. In Ratnagiri district more number of malaria cases are contributed by Chiplun taluka (71.43%) followed by Sangameshwar taluka.

It can be concluded that in Ratnagiri district there is prevalence of both *P. vivax* and *P. falciparum* infections. Adults are more vulnerable to disease in this area and the working group (20-40 yrs) are more affected due to malaria. The clinical picture in the falciparum cases is severe. Detailed epidemiolgical studies are indicated in few talukas of the district where *Pf* transmission is high. The malaria situation in this district can be improved by early detection and prompt treatment (EDPT) and generating health awareness in the community. Mosquito control operations are needed especially before the onset of rainy season as malaria prevalence is high during the rainy season in this area.

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