Outbreak of malaria: an experience at MOH Division, Mawanella

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Abstract

Objectives To study clinical aspects of the 2001 outbreak of malaria at Medical Officer of Health Division, Mawanella and to analyse the incidence in subsequent years.

Design & Setting A prospective study of all blood film positive malarial cases presenting to the Base Hospital, Mawanella from June to September, 2001 and in subsequent years.

Method Data was collected from the Register of Anti-Malarial Campaign, Microscopy Service, Mawanella, Bed Head Tickets, interviewing patients and visiting the area.

Results During outbreak a total of 366 malaria infections were detected and 120 patients (32.78%) were in the paediatric age group (0–14 years). Of the infections, 277 (75.68%) were due to *Plasmodium vivax* and 89 (24.32%) to *Plasmodium falciparum*. Emergence of *P. falciparum* was detected by the Antigen Test. During this 4 month period a significant number of children had repeated infections mostly due to relapse with *P. vivax* or re-infection with *P. falciparum*. Two children were treated with quinine. A very low incidence of malaria was observed in the four subsequent years.

Conclusions Outbreak of malaria should be expected when suitable climatic and geographical conditions prevailed in wet zones. Antigen Test is important in identifying species in difficult cases. Low incidence.

Introduction

Malaria is a major public health problems in Sri Lanka. Climatic change is an important determinant for incidence of Malaria in endemic as well as non-endemic areas[1]. Epidemiological data in subsequent years was due to heavy showers reveals that Mawanella Medical Officer of Health (MOH) Division experiences outbreaks of malaria during severe droughts. Fortunately, it happens once or twice a decade[2]. The most recent epidemic was observed in year 2001 due to severe drought which prevailed in the middle part of the year. The South-western monsoon failed to provide rain as expected from April to August in the year 2001. The adequate rainfall in subsequent years protected the people from malarial threat.

Objective

To study the clinical aspects of outbreak of malaria at MOH Mawanella in 2001 and to analyse the incidence in subsequent years.

Design

A prospective study of all blood film positive cases of malaria admitted to the paediatric ward, Base Hospital, Mawanella from June to September 2001 and an analysis of all microscopically positive patients for malaria presenting to the hospital during this period and subsequent years.

Method

The total number of patients studied was taken from the Register of Anti-Malarial Campaign Microscopy Service, Mawanella. Details of paediatric admissions were obtained from the Bed Head Tickets (BHTs), interviewing the patients and visiting the area.

Results

During this period, 366 malarial infections were detected by microscopic examinations. Out of that, 277 infections (75.68%) were due to *Plasmodium vivax* and 89 (24.32%) due to *Plasmodium falciparum*. Mixed infections comprised 3 (0.81%) patients. Among the 366 patients, 120 (32.78%) were in the paediatric age group (0–14 years), 29 (24.16%) received in ward treatment and others were treated in the out patient department (OPD) or in the paediatric clinics.

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Out of paediatric patients none of the infants presented with malaria. The majority of the patients 91/120 (75.8%) were between 4–10 years and the minority, 13 (10.8%) were between 1–4 years. All the patients were admitted with the main complaint of fever and a few 3 (2.5%) with fever and convulsions. Faintishness was an additional complaint in older children and vomiting in younger children. Although the spleen was palpable in 20.6% of patients, it never enlarged more than 3 cm below the left costal margin, even with repeated infections. Pallor was noted only in 31% of patients. The lowest haemoglobin (Hb) level was 7.3 g/dl.

Majority of patients were from one part of the Ma Oya river area. Most of them live in poorly built houses. The area is adjacent to Rambukkana MOH division that contains Ranakengama, Yatimahana, Dunagama and Kondeniya.

During the outbreak, emergence of *P. falciparum* was detected by the Antigen Test.

Case History 1

In June and July, a 10 year old girl had two attacks of malaria with *P. vivax*. First attack was treated in the OPD. For the second attack she was admitted to the ward and treated with chloroquine and primaquine. The latter was given for 14 days. Malarial parasite (MP) was negative after 7 days of treatment. Three weeks later she was re-admitted and blood film showed *P. vivax* malaria. As the patient had a 14 day course of primaquine, there was a suspicion about the accuracy of species identification. Finally, the patient was sent to Department of Parasitology, Peradeniya for species identification and *P. falciparum* species were identified. The peripheral blood film was tested and ring forms were detected. To identify the species, examination of thin film is mandatory[3]. The latter procedure is not done as a routine blood test because of technical difficulties. The ring forms of *P. falciparum* were identified and confirmed by Antigen Test. This alerted us the emergence of *P. falciparum* during this epidemic. In addition species variation was noted during the epidemic (Table 1).

Table 1
Species Variation during the Epidemic

Months	P. vivax	P. falciparum	Total
June	63	00	63
July	178	13	191
August	27	52	79
September	09	24	33
Total	277	89	366

As can be seen in the table epidemic started with *P. vivax* but by the 3rd month majority of new cases were due to *P. falciparum*.

A significant number of children had repeated infections (15/29) as shown in table 2.

Table 2
Analysis of number of infections in ward admissions

No. of Infections	No. of Patients
01	14
02	07
03	06
04	01
05	01

Of the 6 patients who had 3 infections four patients had 2 attacks of *P. vivax* and the 3rd from *P. falciparum*. In two patients all three attacks were due to *P. vivax*.

Summary of Treatment

All the paediatric patients who were admitted with *P. vivax* infection (even with 1st attack of malaria) were given 14 days of primaquine as suggested by the Anti-Malarial Campaign. They did not present with another attack of *P. vivax* for the next 6 months. As the number of patients with *P. falciparum* started rising even the 1st attack of *P. falciparum* was treated with sulphadoxime and pyrimethamine. Two patients received treatment with oral quinine.

Case History 02

An 8 year old boy from Ranaketugama had 3 attacks of *P. vivax* during the first two months of the outbreak (only 3rd attack was treated in the ward). He again presented with 4th attack (*P. falciparum* was positive) and was treated with sulphadoxime and pyrimethamine (Fansidar) 1 1/2 tablets and primaquine 3 tablets. He again presented with fever in 4 weeks time and was investigated at Department of Parasitology, Faculty of Medicine, Peradeniya. The 'thin film' showed gametocytes and ring forms, the 'thick Film' showed ring Forms and the Antigen test was positive for *P. falciparum*. He was treated with oral quinine 200 mg tds for 7 days. Gametocytes and ring forms disappeared in the peripheral blood film in 72 hours. There was no relapse or re-infection for the next 6 months.

Case History 03

A 6 year old girl was admitted with fever and three episodes of fits within 24 hours. Those fits were short lasting and there was very mild post-ictal drowsiness. Blood film (thick) showed *P.falciparum* (ring forms + gametocytes) and the child was treated with oral quinine. Recovery was complete. None of the other patients had features suggestive of cerebral Malaria. No fatalities were reported.

During the last 4 years, the total number of patients who were *positive* for malarial parasite was less than 20 per year. *P. falciparum* positive patients were not detected during the last three years, only five patients were detected in 2002.

Discussion

Ma oya River flows across the MOH division, Mawanella. The under privileged population along the banks of the river were the culprits of this out break. There were pits on the rocks made as a result of continuous water currents fall onto it during wet season. Small pockets of water collected in these pits and over the sand during drought created very suitable breeding places for Anopheles mosquitoes.

This study clearly shows that we should be vigilant on species identification during an unexpected epidemic. It emphasizes the importance of the Antigen test in doubtful patients. There was a significant number of *P. falciparum* infections during this outbreak[4]. A large number of patients who had repeated *P. vivax* infections probably relapsed after a 5 day course of primaquine. But 14 days treatment with primaquine was a better option[5]. Patients who had *P. vivax* infection never relapsed after 14 days treatment with primaquine. The second attack of *P. falciparum* occurred within 5 weeks of the 1st infection, although the patient had been treated with sulphadoxime and pyrimethamine, querying the emergence of drug resistant *P. falciparum* infection. So, it is advisable to repeat blood film examination 7 days after completion of treatment[3].

There were no significant splenomegaly or pallor found even with repeated infections. It was noted that none of the pregnant mothers were affected during this outbreak[6]. Although the majority of the patients live in poorly built houses, this was not properly studied during this outbreak[6]. The vigilant action taken by the staff of Anti Malarial Campaign and officers of MOH, Mawanella, managed to control the emergent epidemic within a short period of time by using an insecticide, a synthetic Pyrethroid, 5% wdp Deltamethrine[2].

A very low incidence of malaria was observed during the next four consecutive years (2002 – 2005) clearly showing how the pattern of rainfall influences the incidence of malaria. Heavy showers prevailed throughout this period protecting the population from the malarial threat.

Conclusion

Unexpected epidemics can occur in the wet zones depending on the amount of rainfall and suitable geographical conditions. Antigen test is mandatory to identify malarial species in difficult cases. *P. falciparum* infection is on the rise and drug resistance may be a problem in the future.

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