Original Research Article

A Study of Clinical Profile of Malaria and its management in Pediatric age group at urban hospital

Madhuri P. Kadam*

MD, DCH., Pediatrician and Neonatologist, Baliga Nursing home,SV Road, Goregaon (w), India

Received: 02-11-2020 / Revised: 15-12-2020 / Accepted: 20-01-2021

Abstract

Introduction: Malaria is known to exist in India for thousands of years. Inspite of phenomenal progress in medical science in the later half of present century, malaria still continues to be a major killer of man-kind, especially in developing and under developed countries. The aim of this study was to assess the incidence of malaria in an urban hospital, with the observation of the response to routine antimalarial and to assess the clinic-pathological co-relation of malaria. **Material and methods:** All the selected patients were admitted in pediatric unit. Detailed records as the case history, clinical examination, laboratory investigations, and treatment given by the respective physicians were recorded. Patients with history of fever without peripheral smear positive for malaria were also included in the study as they showed response to antimalarial given empirically. **Results:** Out of these 100 patients, 62 (62%) were males and 38 (38%) were females. 37% cases were observed between 5-8 years 27 % cases were observed in 9-12 years and 25% were observed between 1-4 years. Chills and rigors were reported in 76%, history of duration in a range of 1-15 days. Nausea and vomiting was present in 36% where as 2% had headache, Pain abdomen was reported in 6%, cough in 30%, jaundice in 7%, convulsions in 9% and haematuria in 5%. **Conclusion:** Respiratory manifestations are more commonly observed in vivax malaria whereas mixed infections are presenting with less severe symptoms. In our study chloroquine was used as the first drug of choice, whereas for complicated cases quinine is the first choice of therapy, though artemisinin compounds are also useful.

Keywords: Malaria, Pediatric patients, Fever, Chloroquine.

Introduction

Malaria continues to be a major public-health problem in most tropical countries and it is common parasitic infection causing high mortality and morbidity in children. As per the World Malaria Report 2009, there were 1.53 million confirmed cases of malaria from India, of which 0.77 million were due to Plasmodium falciparum[1].A declining trend has been observed in the global incidence of malaria in recent years; compared to the year 2000 (where global incidence stood at 262 million cases and 839,000 deaths), the incidence and number of deaths due to malaria have decreased by 18% and 48% respectively[2].A similar trend has been observed in pediatric malaria where the incidence decreased from 33% in 2000 to 16% in 2015[2]

Globally 69% of total malarial deaths are in children below 5yrs of age in 2015[3].Mortality due to malaria in India is reported to be around 20.6% in pediatric age group. Among cases of malaria, proportion of Plasmodiumvivax and Plasmodium falciparum varies in different parts of India. Areas with more than 30% of Plasmodium falciparum cases arecategorized as high risk. 60-65% of malaria in India is due to Plasmodium falciparum and 35% are due to Plasmodiumvivax. Severity of clinical manifestations varies with species causing the infection and age of the host. Traditionally severe clinical manifestations are usually reported with Plasmodium falciparum. Few recent studies also reported severe manifestations with vivax malaria in children[4].There is paucity of data of severe manifestations due to vivax in children. Most of the data on profile of severe malaria in children are reported from Africa and few from India[4,5].

*Correspondence
Dr. Madhuri P.Kadam
MD, DCH., Pediatrician and Neonatologist,
Baliga Nursing Home, SV Road Goregaon (w), India.
E mail: drmadhurikadam@gmail.com

The reported resistance of malarial parasite to chloroquine, commonly employed antimalarial drug, was the main limiting factor in effective treatment of malaria resulting in a higher mortality.

It is necessary that research may be conducted in various aspects of the disease not only to control it but also to effectively treat cases of malaria with the hope of eradicating malaria from the country.

A revised national drug policy on malaria has been adopted by the Ministry of Health and Family Welfare, Govt. of India in 2010, and further these guidelines in the treatment of malaria were revised in 2011. These guidelines are the collaborative effort of National Vector Borne Disease Control Programme (NVBDCP), National Institute of Malaria Research and expertsfrom different parts of the country[6]. These guidelines have been successfully implemented in our hospital and we would like to examine the impact of the same. So the aim of this study was to assess incidence of malaria and its clinic-pathological co-relation. We also wanted to observe the response to routine antimalarial drugs and to study the complications.

Materials and Methods

This study was conducted at Bombay hospital institute of medical sciences.100 patients of malaria admitted at an urban hospital were studied retrospectively as well as prospectively.

This sturdy was carried out to evaluate the clinical profile of malaria in urban population. All the selected patients were admitted in pediatric unit.

Detailed records as the case history clinical examination, laboratory investigations, and treatment given by the respective physicians were recorded. Patients with history of fever without peripheral smear positive for malaria were also included in the study as they showed response to antimalarials given empirically.

Clinical history and physical examination were recorded on a questionnaire for eliciting information about whether patient or anyone in the family is/or had suffered from malaria. Full course of antimalarial was taken or not radical therapy was given or not, whether the patient had travelled recently to endemic area for malaria etc; surrounding environment etc.

The following investigations were carried out and recorded CBC, pheripheral smear for malaria parasite (thick and thin smears). Antigen – antibody studies; platelet count, bilirubin, SGOT, SGPT, RBS, BUN, creatinine, Reticulocyte G6PD, Urine routine, X-ray chest.

Some clinical features and relevant physical finding were recorded as follows:-

- Detailed H/o fever, with or without chills/rigors, type
- H/o jaundice
- H/o convulsion, altered sensorium
- Hematuria
- Increased creatinine
- G_6PD
- Thrombocytopenia
- Response to routine antimalarials, complications and relapse of fever by follow up was studied and noted.

Results

A total of 100 paediatric cases were treated for malaria as inpatients. Out of these 100 patients, 62 (62%) were males and 38 (38%) were females. 37% cases were observed between 5-8 years, 27 % cases were observed in 9-12 years and 25% were observed between 1-4 years. Age and sex wise distribution is shown in Table 1 and figure 1. Among these cases, 36 (36%) cases were P. vivax infection, 46 (46%) were P. falciparum, 11 (11%) were mixed malarial infections, Figure 2. Analysis of Relevant Clinical Features in All Patients was shown in table 2. Analysis of the clinical symptoms during admission showed that all (100%) cases were admitted with fever, history of duration of fever in a range of 1-15 days. Chills and rigors were reported in 76%, history of duration in a range of 1-15 days. Nausea and vomiting was present in 36% where as 2% had headache, Pain abdomen was reported in 6%, cough in 30%, jaundice in 7%, convulsions in 9% and haematuria in 5%. The predominant symptoms were fever, chills, rigors, nausea and vomiting in all types of malaria (Table 2). Distribution of laboratory parameter were shown in table 3.Combination of antimalarials and treatment given to the patients were shown in Figure 3 & 4.

Table 1: Age Distribution

Age in Yrs	No. of Cases	Percentage
0-1	5	5
1-4	25	25
5-8	37	37
9-12	24	24
13-15	9	9
	100	100

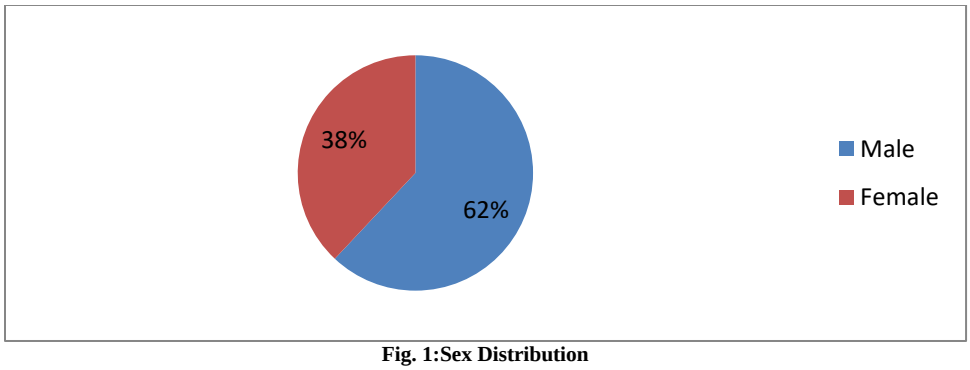

Fig. 1:Sex Distribution

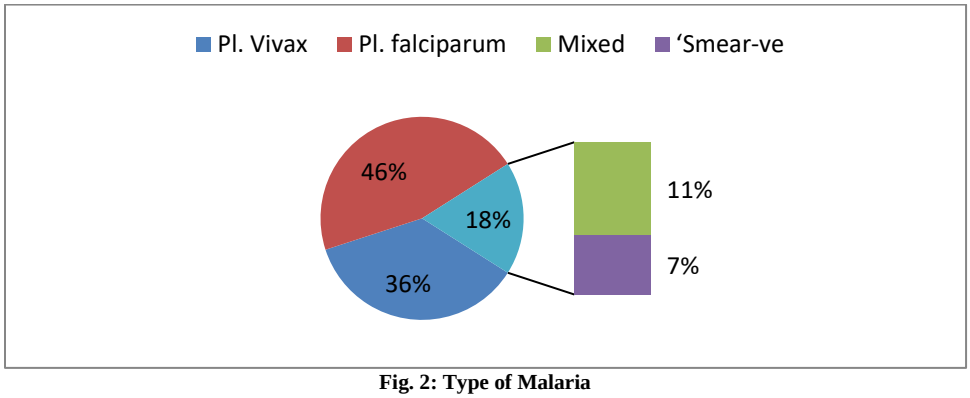

Fig. 2: Type of Malaria

Table 2: Analysis of Relevant Clinical Features in All Patients

Clinical Features	No. of Cases	Percentage
Fever	100	100
Chillis&/or rigors	76	76
Type of Fever		
a) Intermittent	76	76
b) Continuous	20	20
c) Mixed	4	4
d) Temp	32 patients had fever above 38^0C	
Cough	30	30
Gl symptoms	42	42
a) Vomiting	36	36
b) Abdominal Pain	6	6
Neurological Manifestations		
a) Convulsions	9	9
b) Altered sensorium	4	4
c) Headache	2	2
Total	15	15
Pallor	55	55
Jaundice	7	7
Hematuria	5	5
Oliguria	3	3
Melena	3	3
P/H/O malaria in self or family	33	33
Bronchitis	9	9
Spleen	71	71
Liver	58	58

Table 3: Distribution of laboratory parameter

Hb levels	No. of Cases	Percentage
Very severe < 4 gm%	1	1
Less severe 4-6 gm%	7	7
Very severe 6-8 gm%	18 / 61	18 / 61
Very severe 8-10 gm%	35	35
>4 gm%	39	39
Total	100	100
Investigation	**No. of Cases**	**Percentage**
G_6PD	1	1
Thrombocytopenia	22	22
Antigen / Antibody studies	'5' patients positive for Pl. falciparum	'5' patients positive for Pl. falciparum
Hyperbilirubinemia	Not seen	Not seen
Hyperbilirubinemia	10	10
Mid increase in serum creatnine	2	2
Increased reticulocyte count	6	6
Increased SGPT / SGOT	9	9

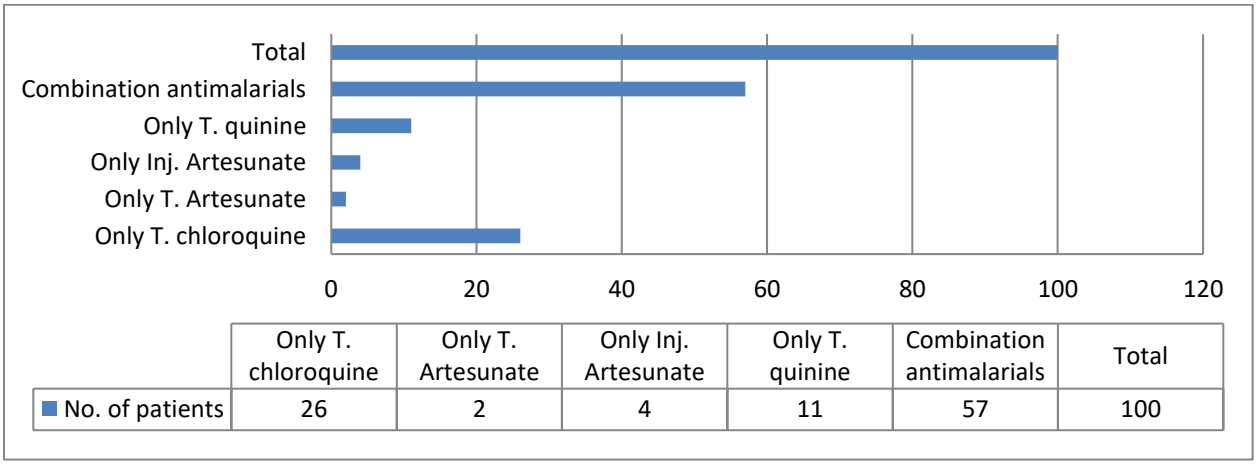

Fig. 3: Treatment given

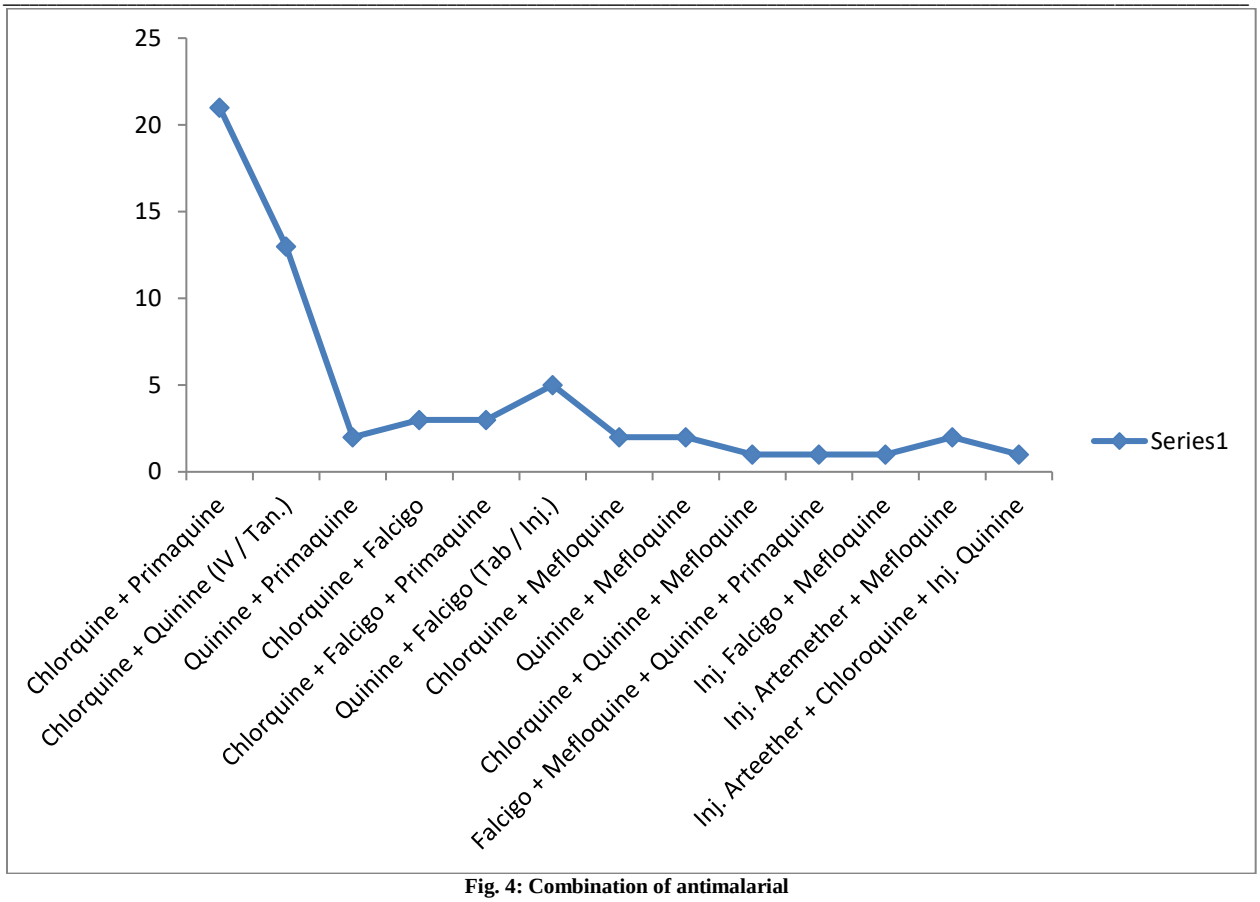

Fig. 4: Combination of antimalarial

22 patients had fever within 1 months of treatment out of which 1 patient was given quinine and one patients was falcigo only. They were again positive for malaria which is shown as follows

Table 4: Again positive for malaria

Treatment given	Pl. Vivax	Pl. falciparum	Mixed	Smear negative	Total
T. Chloroquine	9	7	1	3	20
T. Falcigo	1	0	0	0	1
T. Quinine		1			1
Grand Total					22

Discussion

In the present study highest prevalence of malaria was seen in children of age group between 5-8 years (37%). This is in contrast with the studies done by Ragini et al[7] and Pankiti D Desai et al[8], where children above 6 years are more commonly affected; this can be explained by high endemicity in this area.

Plasmodium falcifarum is the most frequent implicating species accounting for 46% of cases. P vivax and mixed infections accounted for 36% and 11% of cases respectively. Study by P verma et al in 179 children observed P falcifarummalaria in 57.8% of cases and Pvivax and mixed infection in 13.7% and 27.4% of children respectively[9].In the present study P falcifarumis common agent in all the age groups. This is in contrast to studies which have found high prevalence of P vivax[10]. In the present study Pvivax is found in 36% of children. Species infecting the children may vary even in the same country because of different prevailing ecologic conditions resulting in breeding of different vectors. Study of prevalence of malaria in agency areas of Andhra Pradesh showed P falcifarumto be frequent infecting agent in all seasons[11].

Anstey et al. suggested that P. vivax patients are more likely to suffer from respiratory distress syndrome as they have more severe alveolar capillary dysfunction. Sequestration of P. vivax infected erythrocytes in the pulmonary microvasculature and greater inflammatory response to a given parasitic burden in P. vivax are probably responsible for this alveolar capillary dysfunction. Small airway obstruction, gas exchange alteration, increased phagocytic activity, and accumulation of pulmonary monocytes are the other suggested mechanisms for respiratory complications[12].

There has been a recent surge of cases of cerebral malaria caused by P. vivax[13,14].Sequestration of infected red blood cells in cerebral vessels is a feature of cerebral malaria. Results of a study by Kochar et al. showed that vivax malaria can have both sequestration-related and non-sequestration-related complications of severe malaria, including cerebral malaria[10]. Profound thrombocytopaenia is uncommon in malaria due to P. vivax, although it is well-documented in P. falciparum-associated malaria[15].It could be a result of direct lysis of platelets by P. vivax or by immunological destruction by platelet-associated IgG antibody. We observed thrombocytopaenia in 74.1% of the malarial children, a significantly high proportion, although similar paediatric cases have been reported earlier[16].

The present study highlighted the change in the epidemiology of childhood severe malaria in the urban setting of North India. However, annual reporting with multicentric design of prospective studies is required to establish and confirm this trend.

Conclusion

In our study, vomiting abdominal pain cough headache were common symptoms associated with fever.The study stresses that Plasmodiumvivax can result in severe disease and can no longer be considered a benign condition. However, larger studies need to be undertaken to establish the specific severity parameters and poor prognostic indicators. Respiratory manifestations are more commonly observed in vivax malaria whereas mixed infections are presenting with less severe symptoms.in our study chloroquine was used as the first drug of choice,whereas for complicated cases quinne is the first choice of therapy, though artemisinin compounds are also useful.

References

1. World Health Organization. World malaria report 2009. Geneva: World Health Organization, 2009. 66 p. (http://whqlibdoc.who.int/publications/2009/ 9789241563901_eng.PDF, accessed on 12 November 2010).
2. World Health Organisation. World malaria report 2015. Geneva: World Health Organisation; 2015. http://apps. who.int/iris/ bitstream/10665/ 200018/1/ 9789241565158 _eng. pdf.
3. World Malaria Report; Malaria in children under five. World Health Organisation [cited on 2016 apr 6]. Available from http://www.who.int/malaria/areas/high_risk_groups/ children/en/
4. Kaushik JS, Gomber S, Dewan P. Clinical and epidemiological profiles of severe malaria in children from Delhi, India. J Health PopulNutr. 2012 ;30(1):113-6.
5. Yadav D, Chandra J, Aneja S, Kumar V, Kumar P, Dutta AK. Changing profile of severe malaria in north Indian children. Indian J Pediatr. 2012 ;79(4):483-7.
6. World Health Organization. The guidelines for the treatment of malaria. 2nd ed. Geneva: WHO; 2010.
7. Singh R, Kumar S, Rana SK, Thakur B, Singh SP. A comparative study of clinical profiles of vivax and falciparum malaria in children at a tertiary care centre in uttarakhand. J ClinDiagn Res. 2013 ;7(10):2234
8. Desai Pankti D, Vasavda Halak, Vora Hetal D, Mansuri S H, Patel Bhavesh. Clinical spectrum, complications & treatment outcomes of malaria (in pediatric patients). National Journal of Integrated Research in Medicine. 2013; 4(2): 140-143.
9. Verma P, Shukla US, Kalraiya A. Retrospective study on clinical profile of severe malaria in children admitted in a tertiary care centre of central India. People's J Sci Res 2014; 7(1):22-6.
10. Kochar DK, Das A, Kochar SK, Saxena V, Sirohi P, Garg S, Kochar A, Khatri MP, Gupta V. Severe Plasmodiumvivax malaria: a report on serial cases from Bikaner in northwestern India. Am J Trop Med Hyg. 2009 ;80(2):194-8.
11. Raju MH, Ganesh N, Kumar KK, Sowjanya M, Satish PV, Sunita K. A study on prevalence of malaria in different mandals of east Godavari district,Andhra Pradesh,India.International Journal of Latest Research in Science and Technology. 2014; 3(6):74-77.
12. N. M. Anstey, T. Handojo, M. C. F. Pain et al., "Lung injury in vivax malaria: pathophysiological evidence for pulmonary vascular sequestration and posttreatment alveolar-capillary inflammation," The Journal of Infectious Diseases, 2007;195(4):589–596
13. Thapa R, Patra V, Kundu R. Plasmodiumvivax cerebral malaria. IndPediatr 2007;44:433-4.
14. Sanklecha MU, Raghavan K, Mehta MN. Cerebral malaria vivax or mixed? Indian Pediatr 1994;31:1133-4.
15. Jadhav UM, Patkar VS, Kadam NN. Thrombocytopenia in malaria-correlation with type and severity of malaria. J Assoc Physicians India 2004;52:615-8.
16. Aggarwal A, Rath S, Shashiraj. Plasmodiumvivax malaria presenting with severe thrombocytopenia. J Trop Pediatr 2005; 51:120-1.

Conflict of Interest: Nil
Source of support:Nil