

Clinical Profile of Malaria in Children in a Tertiary Care Centre

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Abstract: Malaria is an infectious disease caused by *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium malariae* or *Plasmodium ovale*, which affects all age groups. The symptoms may be from uncomplicated to complicated ones affecting multiple systems. Objective: To observe the clinical profile of malaria patients admitted in the pediatric ward of a tertiary care centre in Guwahati. Materials and methods: A total of 88 children were admitted from June 2013 to June 2016 which were confirmed by PBS study and Card test (Pf and Pv). Results: Of the total 88 patients, fever was the commonest presentation and the commonest complication noticed was impaired consciousness.

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I. Introduction

Malaria is the most important protozoal disease caused by the genus *Plasmodium*. There are four species pathogenic to man, *P. vivax*, *P. falciparum*, *P. malariae* and *P. ovale*. In India most deaths are attributable to *P. falciparum*.

Malaria is an important tropical disease, affecting about 350-500 millions of people and over one million deaths. Of regions endemic for malaria, >70% cases are in Sub-Saharan Africa. Malaria is a important cause of morbidity and mortality in South-East Asian countries including India. (Approximately 2.48 cases are recorded and 75% cases of it is from India). The National Vector Borne disease Control Programme reported around 0.8 million cases in India with some 300 deaths; 60% of which is due to *P. falciparum*.

Criteria for severe malaria

Clinical findings

- Impaired consciousness or unarousable coma
- Prostration, generalized weakness; patient unable to walk or sit up without assistance
- Failure to feed
- Multiple convulsions-more than two convulsions in 24 hours
- Deep breathing, respiratory distress: acidotic breathing
- Circulatory collapse or shock, systolic blood pressure <70mmHg in adults <50mmHg in children
- Clinical jaundice plus evidence of other vital organ dysfunction
- Hemoglobinuria
- Abnormal spontaneous bleeding
- Pulmonary edema

Laboratory findings

- Hypoglycemia (blood glucose <40mg/dl)
- Metabolic acidosis (plasma bicarbonate <15mEq/l)
- Severe normocytic anemia (Hb <5g/dl, packed cell volume)

Hemoglobinuria

- Hyperparasitemia (>2% or 1000000/μl in low intensity transmission areas or >5% or 250000/μl in areas of high stable malaria transmission intensity)
- Hyperlactemia (lactate >5mmol/l)
- Renal impairment (serum creatinine >3mg/l)

II. Materials And Methods

A total of 88 cases between the age group of 1 month to 12 years were admitted in the Pediatric ward of Gauhati Medical College and Hospital between 2013 June to 2016 June. Ethical clearance was taken from the ethical committee of the Institution. The patients were confirmed by peripheral blood smear (both thick and thin) for malaria parasite and/or by positive rapid malaria antigen test (parasite LSD based). All admitted patients presenting with features of impaired sensorium, seizures, irrelevant talking were evaluated further by doing a lumbar puncture test for physical, chemical and biological examination to rule out other CNS infections. Patients were also investigated for total leucocytic count, differential leucocytic count, hemoglobin level and platelet count, serum urea and creatinine. Liver function test, Random blood sugar, Arterial blood gas analysis and chest X ray were done wherever indicated. The results were analyzed statistically comparing the three groups (Pv, Pf and mixed infection), using Chi-square test for P value. Values <0.05 were considered significant.

III. Results

Among the confirmed cases 35.2% had P.falciparum(Pf), 15.9% cases were P.vivax(Pv) and 48.8% had mixed(Pf+Pv) infection

Males outnumbered females in both vivax, falciparum infection as well as in mixed infection

Age group: Number of children above 5 years was 55(62.5%) and those below 5 years are 33(37.5%). The median age group noticed in the study was 6.8yrs.

Of the 88 admitted patients, Fever was observed in 80 patients, Severe anemia in 5 children, Convulsion was seen in 8 patients, Altered sensorium in 27 cases, Oliguria in 2 patients, Spleno-Hepatomegaly seen in 20 cases, Hepatomegaly seen in 8 cases, Splenomegaly seen in 11 cases, Jaundice was noticed in 4 cases, Respiratory distress in 1 case, Hematuria in 2 cases, Acidosis in 1 case, Vomiting in 1 case and Hypoglycemia was seen in 8 cases.

The mean duration of hospital stay was of 5.7 days in p.vivax, 6.2 days in P.falciparum and 6.2 days in mixed infection suggesting that Plasmodium vivax patients took lesser period of time to recover.

Mortality was seen highest amongst patients with mixed infections(Pf+Pv) -9/13 cases followed by P falciparum(Pf)- 4/13 cases. No case of P. vivax(Pv) expired during that study period.

Mortality was seen to be more in children above 5 years of age 11/13 cases and 2/13 cases were below 5 years of age.

Percentage of Mortality in the present study was found to be 14.77%

The commonest complication noticed with mortality of the patients was impaired consciousness and convulsion which were features of severe malaria.

Tabular presentation of the clinical features are given below:

1. Age Distribution

1 months-5years	Above 5years to 12 years
33	55

2. Sex Distribution

Male	Female
52	36

3. Clinical features

Symptoms and signs	No of patients n(%)	P value
Fever	80(90.9%)	0.018*
Chill and rigor	4(4.5%)	0.31
Impaired consciousness	19(21.5%)	0.007*
Convulsions	3(3.405%)	0.46
Hepatomegaly	8(9.09%)	0.02
Splenomegaly	11(12.5%)	0.0104*
Hepato-splenomegaly	5(5.68)	0.76
Respiratory distress	1(1.13%)	0.069
Acidosis	1(1.13%)	0.069
Severe anaemia	5(5.68%)	0.602
Hypoglycemia	2(2.27%)	0.79
Cola coloured urine	2(2.27%)	0.79
Jaundice	4(4.54%)	0.502
Vomitting	1(1.13%)	0.39
Oliguria	2(2.27%)	0.79

P value <0.05 is considered significant which is shown in the above table as *

4. Number of patients affected by Plasmodium vivax, Plasmodium falciparum and mixed infections

Plasmodium vivax (Pv)	Plasmodium falciparum (Pf)	Mixed infection (Pf+Pv)
14	31	43

5. Mortality profile

Above 5 years	Below 5 years
11	2

IV. Discussion

The total number of patients admitted in the pediatric ward were 88 out of which P.vivax was 14(15.9%), P.falciparum was 31(35.22%) and mixed infection was 43(43.86%).Most of the literature available showed lesser percentage of mixed infection in the affected children. This could be probably explained because of the smaller sample size in the present study.

Malaria was seen to be more in children above 5 years of age in the present study which was also noticed by KwentyTE et al.[7].

In the present study it was noticed that severity was more in children above 5 years of age though most studies showed that it was mostly in the children below 5 years of age. This probably may be due to smaller sample size in the present study.

Males (52) outnumbered females (36) in vivax, falciparum as well as in the mixed infections which was probably due to higher health seeking behavior for male child and similar observation was noticed by, Yadav D et al.[1]

The commonest presenting symptom seen was fever 80(90.90%). which was also seen in the study by Verma.P et al.[8] P value was found to be 0.0188 which was found to be statistically significant.

Splenomegaly was seen in 11 cases(12.5%) with a significant Pvalue of 0.015.It was also noticed by AhmadSH et a.[9] Impaired consciousness was commonest complication noticed in 19(21.59%) children of the admitted patients. P value was found to be 0.0077 which was statistically significant. Similar observation was also noticed in the study by Kwenti TE, et al.[7] This was mostly noticed in patients with mixed infection followed by infection with P.falciparum infection.

In the present study severe malaria was noticed in P.vivax, P.falciparum as well as in mixed infection which was also noticed by VermaP et al[8].

The patients who died showed multiple complications like, impaired consciousness (13cases) also noticed byYadavD et al[1], Satpathy SKet al [6],Acute kidney injury(2cases) Satpathy SK et al [6],Jaundice(2cases) Satpathy SKet al [6],Severe anaemia(2 cases) Satpathy SKet al [6]. The duration of hospital stay in almost all the cases were less than 48 hours and was probably because the time taken to seek medical help was late.

Mortality was seen highest amongst patients with mixed infections (9/13cases) which was also noticed by, Yadav D et al[1]

Mortality was seen to be more in children above 5 years of age in the present study whereas mortality was seen to be more in the children younger than 5 years in other studies Satpathy S.Ket al[6].

V. Conclusion

The study was a retrospective one with a small sample size and severe malaria was noticed with all the Plasmodium species with no particular pattern to mention. The cases with multiple complications were seen to be lesser compared to the earlier studies and this is probably due to community awareness by using preventive measures and seeking of early medical help by the affected people.

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