# Original article

## Experience with P. Falciparum Malaria in a tertiary care hospital in Bangladesh.

Rahman MM[1], Ali MZ[2], Akhteruzzaman M[3].

**Abstract**

Malaria Patients are frequently encountered in the Khwaja Yunus Ali Medical College Hospital, Enayetpur,Sirajganj & many of them are Falciparum malaria cases. A total no.of 32 cases of F. malaria patients were studied by clinical presentations, laboratory investigations, drug response & outcome in the KYAMCH for two years from December 2004 to November 2006. Blood film positive Plasmodium falciparum cases were studied. All of the patients had fever, 81.25% of the patients had some form of cerebral features, other featurs include gastro enteric features (43.25%), of them had respiratory problems including ARDS (25% ). Immuno-chromatographic test was positive in 87.5% of the cases, which was significant. Most of the patients responded with i.v Quinine injection (87.5%), response with Artemether was 100%. Only four patients out of 32 died. We have come to the conclusion that early institution of vigorous treatment saves a high percentage of patients, everybody concerned must be very must aware of falciparum malaria in this area & other areas too, specially when a patient presents with any of the cerebral features

**Key words :** Falciparum Malaria, Experience, KYAMCH

### Introduction

P. Falciparum malaria continues to be a major global health problem even in this 21st century, every year there are estimated 300 - 500 millions of new cases and 1.5 -3 millions of deaths1. It affects all ages, the reported mortality varies depending on the age, immunity, access to treatment and the complications2. Severe malaria is one of the leading cause of death in Bangladesh as 1389 reported cases of deaths out of 1,52,729 cases that had been reported in 1995. There has been a growing concern about the malaria situation in Bangladesh, particularly in the Chittagong Hill Tracts area, which is a highly endemic zone, Malaria is a highly complex disease which can mimic many diseases and there is no absolute clinical diagnostic criteria4. The clinical features vary depending on parasitemia & immune status. The WHO has suggested criteria for definition of severe malaria for both adults and children & has produced a

hand book outlying the management[5]. Cerebral malaria is the most common complication of F. malaria & the leading cause of death from malaria 6,7. It is defined as acute symmetric encephalopathy associated with sequestration of parasitised erythrocytes in the cerebral capillaries 8. Cerebral malaria accounts for 10% of cases of F. malaria in Bangladesh6. The term severe malaria implicates falciparum malaria with a potential threat to life in absenceof treatment 8,9,10,11 & presence of some the features of severe malaria increases vulnerability to death .11

While working in a tertiary health care centre in the western part of Jamuna river we started experiencing Falciparum malaria cases every now and then . This is an area where Falciparum malaria was virtually unknown as there was no previous study before. So, we decided to have a prospective observational study

### Aim and Objectivs

The aim is to observe various clinical presentations, treatment response & complications observed in this area, & make the people, doctors and the health authorities to be aware of the problem.

### Material and Methods

650 patients presenting with fever were screened for Falciparum malaria by blood films (both thick & thin film) study for malarial parasites. All positive cases of P. falciparum were studied with ICT (Immuno-chromatographic test) for Falciparum malaria. The features of clinical presentation were studied and

(1) Dr. M. Monzur Rahman, Associate Prof. Medicine, KYAMCH, (2) Dr. M. Zulfikar Ali, Senior Consultant, Medicine & Gasrto-enterology, OSD, Minisrty of Health & Family planning, (3) Dr. M. Akhteruzzaman, Clinical Pathologist, KYAMCH Hospital, Dhaka.
Correspondence : Dr.Monzur Rahman

noted. Apart from blood film and ICT in all the cases CBC, blood sugar, routine urine test, renal function, liver functions, serum Electrolyte, CXR were done. CT scan, CSF study were done where needed. Inclusion criteria was all blood film positive cases of Falciparum malaria and exclusion criteria were 1. Malaria cases other than Plasmodium falciparum. 2. Patients with other concomittant illnesses like CVD, Meningitis,ICSOL 3. Other causes of unconsciousnes

**Result**

During the study period of two years starting from December 2004 to November 2006 total 32 cases were found to be positive for P. falciparum by blood film study, out of which 28 cases were positive by ICT (87.5%).

Most of the patients were between age of 21 to 40 years (56.25%) and and lowest incidence was above the age of 60years (6.25%) (table 1) . Among the all positive cases 18 were males and 14 were females (M:F = 9:7)

Table 1: Age incidence ( n - 32 )

| Age | Number | % |
|---|---|---|
| 12 - 20 | 07 | 21.87 |
| 21 -40 | 18 | 56.25 |
| 41 -60 | 05 | 15.62 |
| > 60 | 02 | 06.25 |

most of the cases were found from the month of April to the month of September (28 out of 32, 87.5%) . Least cases presented during winter time, no cases were found from the month of January to March (table 2).

Table 2: Seasonal variation (n - 32)

| Month | Number | Percentage |
|---|---|---|
| January- March | 0 | 0 |
| April-June | 10 | 31.24 |
| July-sept | 18 | 56.25 |
| October-December | 04 | 12.50 |

All the patients had fever (100%). 26 patients had CNS involvement (81.25%). Eight patients were comatose (25%), 18 had altered sensorium (56.25%), & 6 patients had seizures (18.75%).(Table-3)

All the cases under study were blood film positive, out of which 28 (87.5%) were ICT for P. falciparum positive. 24 patients had Leucocytosis (66.6%), 8 had Hyponatraemia (25%), 22 had anaemia(68.7%), 6 patients had renal involvement (18.75%). Two blood-film positive patients, who initially recovered from unconsciousness but with focal neurological signs, were found to have Cerebral infarct by CT scan.

Table 3: Clinical presentations ( n=32 )

| Clinical features | Number (%) |
|---|---|
| Fever | 32 (100%) |
| Headache | 27 (84.37%) |
| Altered sensorium | 18 (56.25%) |
| Coma | 08 (25%) |
| Seizures | 06 (18.75%) |
| Focal neurological signs | 04 (12.50%) |
| Vomiting | 08(25%) |
| Diarrhoea | 03(9.87%) |
| G I bleeding | 02(6.25%) |
| Bleeding from other sites | 06(18.75%) |
| Cough | 08 (25%) |
| Anaemia | 07 (21.87%) |
| Jaundice | 04 (12.50%) |
| Herpes simplex | 01(3.12%) |
| Hepatomegali | 05(15.62%) |
| Splenomegali | 00 (00.00%) |
| Hypoglycemia | 06 (18.75%) |
| Renal failure | 02 (6.25 %) |
| ARDS | 02 (6.25%) |
| DIC | 01 (3.12%) |

Table 4: Results of investigations (n=32)

| Investigations | Number (%) |
|---|---|
| Positive blood film | 32 (100) |
| ICT for P. falciparum+ve | 28 (87.5) |
| Leucocytosis | 24 (66.6) |
| Anaemia | 22 (64.7) |
| Increased S. Bilirubin | 6(18.7) |
| Increased SGPT | 9 (28.1) |
| Urinary RBC +ve | 7 (28.9) |
| Hyponatraemia | 8 (25) |
| Impaired Renal Functions | 5 (15.6) |
| ARF | 1 (3.1) |
| Haemolysis | 6(18.7) |
| ARDS | 2 (6.2) |
| CT scan of brain (infarction) | 2 (6.2) |

Table 5 : Outcome of treatment ( n - 32 )

| Results | Number |
|---|---|
| Improved | 28 (87.5) |
| Death | 4 (12.5) |
| Improved with disability | 03 (9.75) |
| Vegetative state | 01(3.12) |
| Complete cure | 25 (78.12) |

Out of 32 patients of F. malaria cases only 4 cases died (12.5%), 03 patients survived with some disability (9.75%), one had permanent vegetative state (03.12%).

About the drug response, none was given Chloroquin. 24 out of 28 patients treated with Quinine i/v followed by oral, responded well (85.71%), 2 out of 2 (100%) responded with Artemether. One patient treated with Mefloquin died, probably because it was a very bad case who already had DIC.

Table 6 :Drug - response ( n - 32 )

| Drugs | Treated cases | Positive response | Percentage |
|---|---|---|---|
| Chloroquin | Not given | -- | ----- |
| Quinine IV/Oral | 28 | 24 85.71 | |
| Mefloquin | 01 | 00 | 00 |
| Coartem | 01 | 01 | 100 |

**Discussion**

During the study period of 2 yrs we found 32 patients of falciparum malaria, out of which 28 cases were positive with Immuno-chromatographic test (ICT) for Falciparum malaria in KYMCH, Sirajganj.This is a significant number because, this area (west side of Jamuna river) is considered as low endemic area although no previous study was available in this area . In Bangladesh the hilly areas, especially the Chittagong Hill Tracts area is considered as high endemic area (3,6,7,12).In positive cases the sensitivity to ICT is 77%-98% according to Moody 13, in our study, the sensitivity is 87.5%.

The study does not find any significant difference between male and female (M:F=18:14). Most of the cases occurred in young adults. The maximum age group affected are 20-40 yrs (60%) which is almost similar to others studies, such as by Faiz6 64%, Chakrabarty 57.7%

About the seasonal variation. 28 out of 32 (87.5%) cases were found from the month of April to September. This is the Rainy & post rainy season when mosquito breeding is most, and so the transmission of malaria is maximum in our country. No cases were reported from the month of December to the month of February.

Not surprisingly, the Clinical manifestations were varied. All the patients had fever (100%) during the time of presentation or before, similar to many other studies 3,6 although according to few studies occasional afebrile were also encountered. 14.

Neurological manifestations, especially Central nervous system involvement was common problem, 26 out of 32 (81.25%). CNS involvement experienced by other studies were almost similar, such as Faiz et al 95% 6, Gopinathan found 80% 15, Olweny et al 93% 16. 8 patients were comatose and another 18 patients had altered sensorium (56.25%). Seizures of different intensities were observed in 6 cases (18.75%). The same thing observed by Faiz et al6 was (60%), and in a study in Pakistan by Mahmud et al 17 the incidence of seizure was very low (02%), which is surprising.

The next frequent Clinical features were related to the gastro-intestinal system, 14 out of 32 (43.75%), which is does not differ much from the studies by Faiz 46.5% 6, Olweny 53% 16, whereas the study by Mahmud et al 17 had different finding , only 8.33% had gastro-intestinal involvement. Among the GI symptoms vomiting in 8 pts.(25%), diarrhoea in 3 patients

(9.37%) were observed. Two patients had gastrointestinal haemorrhages(6.25%). Bleeding from other sites, such as haematuria (6.25%) was also encountered ,similar to other studies.

Respiratory symptoms were not uncommon (25%).Cough was the most frequent resp.symptom,two patients had ARDS. The respiratory symptoms observed by other studies were Faiz 75% 6, Olweny 64%16, Mahmud et al 7.5%17. So, the observations had wide variations, which is difficult to explain.

Beside these, we found in our study, anaemia in 7(21.87%) patients, jaundice in 4 (12.5%), hypoglycaemia in 6 (18.75%), Herpes simplex in 1 (3.12%), and hepatomegaly in 5 (35.87%)patients. Like this study, these were also less frequently experienced in other studies. No case of Splenomegaly was observed in our study, probably because all the cases were of short duration, as there was hardly enough time for clinically observable enlargement of the spleen.

Comparative study of outcome of treatment( n - 32 )

| Name of | Total no. study | Death of cases | percentage |
|---|---|---|---|
| Faiz et al [20] | 22 | 03 | 13.66 % |
| Mitra et al[18] | 14 | 04 | 28.57 % |
| Schmitz et al [19] | 03 | 02 | 66.66 % |
| Current study | 32 | 04 | 12.50 % |

The results of treatment showed that only 4 out of 32 patients succumbed (12.5%), which is very low in comparison to the other studies such as Mitra et al 18 and Schmitz et al 19 had their 28.5% & 66% patients died respectively. The high incidence of death in these studies may be explained by the fact that during their time, almost twenty years back the ICU facilities were not much advanced. But in a study in Bangladesh by MA Faiz 20, only 13.66% died. Out of 28 patients survived, one left with psychosis (improved after treatment), one had permanent vegetative state, and one had permanent aphasia. So, the management results were also encouraging.

**Conclusion**

Although Falciparum malaria is a common cause of fever with multi-system involvement with predominant CNS involvement, and although there are many studies from the CHTs area of Bangladesh, no such studies are available from this area yet. This study , because a small scale one and observed in a single institution, may not reflect the real picture in the greater population. Still it may inspire others to come forward with further and elaborate study. All concerned must be aware of the problem, especially any patient with fever with any of the CNS features should have blood film examination for Falciparum malaria, and all suspected case should have Immuno-Chromatographic Test , where available, because of its high sensitivity.

**Reference :**

1. Goldsmith RS. Infectious diseases: Protozoal and helminthic. Current Medical diagnosis & treatment,44th ed. Mcgraw-Hill; 2005:1423-81.

2. WHO. Severe falciparum malaria, communicable disease cluster. Trans. R. Soc. Trop. Med Hyg.2000; 94: S1-90.

3. Waiz A, Chakrabarty B. A ten year retrospective study. Armed Forces Med J 1986; 1 :7 - 11.

4. Wilairatana P,Looareesuwan B. Guidelines in the management of severe malaria. J. of Indian Med Assoc. 2000; 98: 628-631.

5. WHO. Managment of severe malaria .2nd ed. Geneva.2000.

6. Faiz MA. Astudy of clinical presentations malaria. Bang. Med J.1982; 11:41 - 52.

7. Warrell DA, Molyneux ME, Beales PF. Severe and complicated malaria. Trans. Royal Soc. Trop. Med. Hyg. 1990; 84(2): 1 - 65.

8. Macpherson GG, Warrell MJ, White NJ, Looreesuwan S, Warrell DA. Human Cerebral malaria : a quantitative ultrastructural analysis of parasitised erythrocytes sequestration. Am. J. Path. 1985; 119: 385 - 401.

9. Manson - Bahr PEC, Bell DR. Malaria and Babesiosis. Manson's Tropical diseases 19th ed. Baillere Tindal, London. 1987; 127 - 134.

10. Faiz MA, Awal ARMA. Cerebral malaria. A study of 29 cases. Bang Med. J. 1980; 15: 73 - 7.

11. Njuguna PW, Newton CR. Management of severe falciparum malaria . Jour. Of post-graduate Medicine . 2004; 50(1): 45 - 50.

12. Hossain SM, Bhuiyan A, Rasheed S. Correlates of perceived malarial episodes and treatment seeking behaviour in a malarial endemic rural area of Bangladesh. South-East Asia J. of Trop. Med Pub. Health. 2001 Dec; 32 (4): 707 -19.

13. Moody A.Rapid diagnostictests for malarial parasites.Cl.Microbiology review:Jan 2002:v-5(1):p-66-78.

14. Akter M et al. Clinical profile of malaria in eastern sector. Medical J. of Armed Forces of India. 1981; 37(3): 212 -19.

15. Gopinathan VP et al. Falciparum malaria in North-Eastern sector. J. of assoc. Physicians of India. 1980; 27; 884.

16. Olweny CLM et. al. Adult cerebral malaria in Zambia. J. of Trop. Med. Hyg. 1986; 89:123 - 29.

17. Mahmud K, Jairamani KL, Abbasi B et. All. Falcipapum malaria : various presentations. Pak. J. of Medical sciences. 2006; 22-30.

18. Mitra NK, Kunte AB.A profile of malaria cases observed in a service hospital. Med J. of Armed F of India 1977; 33: 25-30.

19. Schmitz B, Gelfand MA. Study of clinical features of malaria in Rhodesia. African J. of Med. 1976; 22: 155-7.

20. Faiz MA. Clinical study on malaria Dissertation for BCPS, 1982.