Clinico-epidemiological profile of the falciparum cases attending private clinic in an urban community of Kolkata

Sau M, Mandal PK, Mukherjee A, Manna N, Chakrabarty D, Sanyal S

ABSTRACT

Background: Deaths due to falciparum malaria, vector and drug resistance are increasing. Government setup alone cannot combat the malaria problem; simultaneously the cost of management of malaria in private setup is out of reach to common people.

Objectives: A study was undertaken to study the clinico-epidemiological and laboratory profile of the falciparum cases and to estimate its impact on expenditure pattern and workdays lost.

Methods: It is a descriptive, cross-sectional community based study conducted in ward 37 and 38 of Kolkata. Falciparum case attending a private clinic and completed treatment within 2 weeks of recall period were considered for the study.

Results: Males (83.7%) outnumbered females. Major symptoms were malaise (95.3%), body ache (79.1%), headache (76.7%), nausea (51.2%), vomiting (27.9%) and pain abdomen (23.3%). Thrombocytopenia was seen in 48.8% cases, 34.9% had hyperbilirubinaemia and almost all the patients had anemia (91.6% males and 85.7% females).

Conclusions: The study analyzed the signs and symptoms, cost of treatment, duration of admission and work days lost due to Falciparum malaria, helpful for early diagnosis and future policy making.

Key words: malaria, falciparum, drug resistance, anemia

INTRODUCTION

Malaria is one of the major public health problems not only in India but also in the developed countries. Pre-independent India had witnessed about one million deaths per year due to malaria. Several efforts had been implemented since then, e.g. National Malaria Control Program and National Malaria Eradication Programme yeilding varying degree of success. Though the morbidity and mortality due to malaria has reduced but it is not consistent and still poses a threat. Still 80% of the populated areas are malaria prone and nearly 60% of total malaria cases are of falciparum variety, and it continues to remain one of the most important causes of mortality among infant, child and adults.[1] Several new problems have cropped up like, vector resistance to insecticides and drug resistant malaria.[2] As the drug resistant in falciparum cases is increasing, management is becoming difficult and treatment cost is going beyond the limit of poorer section of the society.[3] Since the epidemiological factors differ with geographical variations; detailed clinico-epidemiological data will help early diagnosis and its management. An estimate of treatment cost in private sector may guide to relook into planning in future policy making for prevention and control of this burden. The present study was conducted to study the clinico-epidemiological and laboratory profile of the falciparum cases and to find out the expenditure pattern and working days lost of the cases.

MATERIALS AND METHODS

It was a descriptive, cross-sectional community based study conducted during June-Nov 2010, in the urban community of ward 37 and 38 (total population 47,852), the field practice area of Medical College, Kolkata. House to house visit was made and the cases meeting the inclusion criteria were considered for the study. After obtaining the informed consent, interview was conducted with a predesigned and pretested proforma that included clinical profile, laboratory findings, treatment cost and work days lost due to illness. Inclusion criteria: plasmodium falciparum case attending private clinic and completed treatment within 2 weeks of recall period from the day of interview. Data were

collected by interview and record. A total of 43 cases found suitable for analysis. MS Excel 2007 and SPSS 16.0 software was used for tabulation and analysis.

RESULTS

Males (83.7%) outnumbered females. Age range of the population was 12-82 years; mean age of 45.35 years and SD of 18.03 years. All the patients presented with fever. Fever was mostly continuous in type and high grade in nature. Among other symptoms, malaise was most commonly reported. (Table -1) The onset of symptoms varied from 2-12 days before diagnosis. Pallor was the most common signs recorded. Two cases of meningitis recorded.

Table 1. Clinical profile of patients (n=43)

Attribute	Number (%)
Profile	No (%)
Continuous fever	33(76.7)
High grade fever	26(60.5)
Malaise	41(95.3)
Headache	33(76.7)
Body ache	34(79.1)
Pain abdomen	10(23.3)
Nausea	22(51.2)
Vomiting	12(27.9)
Jaundice	15(34.9)
Hepatomegaly	5(11.6)
Splenomegaly	8(18.6)
Pallor	35(81.4)

Laboratory findings revealed mean hemoglobin level as 10.26 gm/dl, mean platelet count was 1, 58, 000/ cumm of blood and mean bilirubin level as 1.53 mg/dl (Table-2).

Table 2. Laboratory findings of the cases (n=43)

Lab parameters	Minimum value	Maximum value	Mean	Standard deviation
Hemoglobin (gm/dl)	8	13	10.26	1.25
Platelet (/cumm of blood)	80000	220000	158000	47556.15
Bilirubin (mg/dl)	0.5	6.1	1.535	1.37

The cost of treatment ranged from INR 700- INR 25000. Work days lost due to illness were between 5-16 days (Table-3). Analysis of variance showed

higher cost of treatment and duration of illness among admitted patients (Table-4). Average cost of treatment by IV artemether and lumefantrine therapy was INR 2778.57; followed by artesunate therapy (INR 12809.52); and sulfa and oral artesunate therapy (INR 1112.5). This difference was statistically significant (p=0.000). Patients became afebrile within 3.43 days (average) after starting IV artesunate, followed by 2.64 days with lumefantrine combination, and 1.13 days with salfa and artesunate combination (p=0.002).

Table 3. Treatment seeking behavior, cost incurred in treatment and recovery period after treatment (n=43)

Attributes	Minimum	Maximum	Mean	S.D
Onset of symptoms (days)	2	12	5.23	2.877
Cost of treatment (INR)	700	25000	7367.44	7142.186
Work days lost	5	16	10.02	3.196
Days to become afebrile	1	8	2.74	1.677

Table 4: Analysis of variance of variables regarding lab findings, cost incurred and work days lost with history of admission (n=43)

Variables	F ratio	Significance
onset of symptoms	1.611	.212
Hemoglobin	1.091	.302
Platelet	3.311	.076
Bilirubin	2.529	.119
Cost of treatment	127.021	.000
Work days lost	14.261	.001
Days to become afebrile	8.309	.006

DISCUSSION

We conducted a cross-sectional study in an urban community of Kolkata among the falciparum malaria cases attending the private clinics in the area and we observed that 83.7% of the falciparum cases were males with mean age of 45.35 years ±10.83 years. However, literature reveals prevalence of falciparum malaria is unrelated to gender[4,5,6] and age[4,7,8] . This might be due to different socio-cultural, environmental and genetic factors prevailing in different places, and also non-inclusion of same age groups in respective studies.

Major symptoms observed were fever (all cases), malaise (95.3%), body ache (79.1%), headache

(76.7%), nausea (51.2%), vomiting (27.9%) and pain abdomen (23.3%). Fever was continuous in 76.7% cases, and of intermittent type in the remaining; with a mean duration of 5.23 days±2.87 days. Similar manifestations were observed in other studies though with slight variations.[4,5,6,9,10] We observed pallor in 81.4% of cases followed by jaundice in 34.9% cases. Hepatomegaly and splenomegaly was observed in 11.6% and 18.6% of the study population respectively. However, Khan et al., observed proportion of less pallor, jaundice and hepatomegaly but more splenomegaly (40%).[4] Our study revealed that 34.9% patients had hyperbilirubinaemia, similar to another study.[11] Most patients had anemia (91.6% males and 85.7% females) and the mean hemoglobin level was 10.26 gm/dl, comparable to a study conducted at Sudan.[6] Anemia is expected due to destruction red blood cells by the parasites as well as the immune system.[12]

The average cost of the treatment for outpatients was INR 1085.7 and for hospitalized patients INR 13363.6. This cost was estimated among the patients attending private clinics and admitted in nursing home, where the treatment cost is invariably higher. Mean duration of admission observed in the present study was 5.81 days. This is consistent with the findings of the study conducted at Nigerian hospital.[13] The mean work days lost was 10.26 days, which is comparatively high.[14,15] The mean work days lost in this study is calculated for both complicated and uncomplicated falciparum cases, whereas the compared studies have included uncomplicated cases.

CONCLUSION

This study tries to analyze the clinico-epidemiological profile of falciparum malaria cases with due consideration to the economic burden on and work days lost. Malaria is so widespread and common in our country; multipronged efforts already in place since long yet unbeatable. There is a need to re enforce the existing program as well as to relook into the policies meant to eradicate it. These epidemiological features will be helpful for early diagnosis of plasmodium falciparum malaria cases and measures the economic burden due to malaria which will be beneficial for future policy making.

AUTHOR NOTE

Manabendra Sau, Assistant Professor
Pankaj Kumar Mandal, Associate Professor
Anindya Mukherjee, Assistant Professor
Nirmalya Manna, Assistant Professor, Contact - 9433143168, Email: nirmalya_02@yahoo.com **(Corresponding Author)**
Debadatta Chakrabarty, Assistant Professor
Sandip Sanyal ,(PGT)
Dept of Community Medicine, Medical College, Kolkata.

REFERENCES

1. WHO 2010. World malaria report 2010:51.
2. NVBDCP. Drug resistance status in India: an update. Delhi: Directorate of National Vector Borne Disease Control Programme (Directorate General of Health Services), Ministry of Health & Family Welfare. 2002.
3. Mohapatra PK, Namchoom NS, Prakash A, Bhattacharya DR, Goswami BK, Mahanta J. Therapeutic efficacy of anti-malarials in Plasmodium falciparum malaria in an Indo-Myanmar border area of Arunachal Pradesh. *Indian J Med Res.* 2003 Aug;118:71-6.
4. Khan HU, Khattak AM, Khan MH, Mahsud IU, Shah H. A study of prevalence of malaria in adult population of D.I.Khan, Pakistan. *Biomedica.* 2006; 22(14):99-104.
5. Muddaiah M, Prakash PS. A study of clinical profile of malaria in a tertiary referral centre in South Canara. *J Vector Borne Dis.* 2006 Mar;43(1):29-33.
6. Tagelsir N, Salim EAE, Younis SA, Elimiari G, Adam AA, Ahmed ME et al. A clinico-epidemiological study of falciparum malaria in a cluster of villages in the eastern bank of the River Nile in Northern

Sudan. *Sudanese Journal of Public Health.* 2008;3(1):11-6.

7. Ribeiro MC, Gonçalves Eda G, Tauil PL, Silva AR. Epidemiological aspects of a malaria focus in the districts of São Luis, MA. *Rev Soc Bras Med Trop.* 2005 May-Jun;38(3):272-4.

8. Sheikh AS, Sheikh AA, Sheikh NS, Paracha SM. Endemicity of malaria in Quetta. *Pakistan J Med Res.* 2005; 44: 41-5.

9. Hazra BR, Chowdhury RS, Saha SK, Ghosh MB, Mazumder AK. Changing scenario of malaria: a study at Calcutta. *Indian J Malariol.* 1998; *35:* 111–6.

10. Murthy GL, Sahay RK, Srinivasan VR, Upadhaya AC, Shantaram V, Gayatri K. Clinical profile of falciparum malaria in a tertiary care hospital. *J Indian Med Assoc.* 2000 Apr;98(4):160-2.

11. Harris VK, Richard VS, Mathai E, Sitaram U, Kumar KV, Cherian AM, et al. A study on clinical profile of falciparum malaria in a tertiary care hospital in south India. *Indian J Malariol.* 2001 Mar-Jun;38(1-2):19-24.

12. Dondorp AM, Angus BJ, Chotivanich K, Silamut K, Ruangveerayuth R, Hardeman MR, et al. Red blood cell deformability as a predictor of anemia in severe falciparum malaria. *Am J Trop Med Hyg.* 1999 May;60(5):733-7.

13. Okogun GR, Amadi AN. Epidemiology, therapeutic agents and cost of management of paediatric malaria in a Nigerian tertiary hospital. *J Vector Borne Dis.* 2005 Sep;42(3):87-94.

14. Attanayeke N, Fox-Rushby J, Mills A. Household costs of malaria morbidity: a study in Matala District in Sri Lanka. *Tropical Medicine and International Health.* 2000;59:595-9.

15. Kaewsonthi S. Internal and External costs of malaria surveillance in Thailand. Social and Economic Research Report no. 6. 1998. TDR/WHO, Geneva.