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RESEARCH ARTICLE

# Retrospective analysis of malaria and its complications in a tertiary care centre in Central India.

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## ABSTRACT

**Background:** Malaria is a well-known disease and it continues to be a major public health problem. The disease presenting with various complications is not uncommon. This study was undertaken to analyze and introspect the presentation of this disease in a tertiary referral center.

**Aims:** To find out the clinical presentation and complications of patients of malaria and its outcome.

**Materials and methods:** This was a retrospective study done on patients attending the outpatient and inpatient departments from their records from January 2011 to December 2012.The records were retrieved and scrutinized using a prepared case sheet proforma on the basis of patient's demographic profile, clinical findings, investigations, treatment and complications.

**Results:** Out of a total of 410 patients diagnosed and treated for malaria, 290 were treated as outpatients and 120 cases were inpatients. Infection in males (78%) was far more common as compared to females (22%) and many were within the 21–30 year age group. The incidence of malaria was found to be more during the monsoon season. Plasmodium vivax was the most common parasite (70.97%), followed by P. falciparum (25.85%), mixed malarial infection (3.18%).Combination therapy was given to most of the patients. Hepatopathy was the most common complication and all the deaths were due to cerebral malaria.

**Conclusion:** Malaria is a major health problem in this region, particularly in rainy season and comparatively affects the younger adult population. P. vivax was the major parasite type causing malaria and most of the complications were due to P. falciparum.

**Keywords:** retrospective, malaria, complications.

## 1. INTRODUCTION

Malaria is an infectious disease that, despite being preventable and treatable, threatens the lives of 3.3 billion people around the world. Every year malaria accounts for 219 million cases and 660,000 deaths.[1]High maternal mortality, low birth weight and maternal anaemia are also consequences of this devastating disease.

The malarial parasite is transmitted by the Anopheles mosquito. Symptoms include fever, headache, vomiting and other non-specific flu-like symptoms. If suitable drugs are not administered quickly or there is parasite resistance to treatment, the infection can result in life-threatening anaemia, coma and death.

Uncomplicated malaria is the most common and widespread presentation of the disease. While it is not immediately life-threatening, it requires prompt treatment as if the *P. falciparum* parasite is present; it can develop into severe malaria.

The classic symptoms of malaria consist of bouts of fever that coincide with parasites bursting out of red blood cells, chills, sweats, headaches, muscle aches, nausea and vomiting. Severe malaria occurs when infections, most commonly *P. falciparum*, are complicated by serious organ failures or abnormalities in the patient's blood or



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metabolism. Pregnant women and children are particularly vulnerable to severe malaria

There are a number of anti-malarial drugs which have seen widespread use over the last century, including quinine, chloroquine, mephloquine, sulfadoxine-pyrimethamine and amodiaquine. Misuse of these drugs, however, has led to growing resistance from malaria parasites.

Over the last decade new artemisinin based drugs - artesunate, artemether and dihydroartemisinin - have become available. In an attempt to prevent resistance, these drugs are now used in combination with drugs from a different class forming Artemisinin Combination Therapies (ACTs).

**2. METHODOLOGY:**

This study was carried out in a J.K. Hospital and Research Centre in Bhopal city in Central India. It is a retrospective study done on patients attending the outpatient and inpatient departments of our hospital. Data was obtained from their records. The records were retrieved and scrutinized using a prepared case sheet proforma on the basis of patient's demographic profile, clinical findings, investigations, treatment and complications. The duration of the study was from January 2011 to December 2012.

All patients received treatment based on WHO recommendations for antimalarial chemotherapy. Complicated *vivax* malaria was treated like falciparum malaria using artemisinin based combination therapy (ACT).

The outpatient and inpatient data were analyzed separately due to limitations in the investigations and follow-up in the former. The outpatient data were collected from the OPD and laboratory registers. Patients were enrolled in the study with the following inclusion and exclusion criteria.

**Inclusion criteria:** All the cases were tested positive for malaria parasite and treated at the Department of Medicine in the age group of 15 years and above were included.

**Exclusion criteria:** Patients presenting with fever (malaria smear negative), but treated empirically for malaria were excluded from the study and patients presenting with clinical features mimicking malaria (malaria parasite test negative), as in leptospirosis, dengue fever and sepsis had been excluded.

**3. RESULTS:**

Out of a total of 410 patients diagnosed and treated for malaria, 290 were treated as outpatients and 120 cases were inpatients.

In patients treated in the OPD it was seen that infection in males (67.93%) was far more common as compared to females (32.07%) and many were within the 21–30 year age group. The incidence of malaria was found to be more during the monsoon season. Plasmodium vivax was the most common parasite (82.07%), followed by P. falciparum (13.79%), mixed malarial infection (4.14%).Combination therapy was given to most of the patients.

In the patients who were admitted for treatment it was found that 84 (70%) were males and 36 (30%) were females. The maximum number of admissions occurred during the rainy season. The analysis of symptoms showed that the occurrence of fever was universal (100%). Most of the patients 43 (35.83%) reported nausea and vomiting. Other reported symptoms were jaundice 16(13.33%) cases, cough in 12 (10%), pain abdomen in 7 (5.83%), and altered level of consciousness in 5 (4.17%). Fever, nausea/vomiting and headache were the predominant symptoms in the admitted patients (Table 1).

| Symptoms | P. *vivax* | P. *falciparum* | Mixed infections | Total |
|---|---|---|---|---|
| Fever | 72 | 29 | 9 | 120 |
| Nausea & Vomiting | 15 | 22 | 6 | 43 |
| Jaundice | 0 | 12 | 4 | 16 |
| Headache | 6 | 16 | 7 | 28 |
| Cough | 4 | 7 | 1 | 12 |
| Pallor | 5 | 6 | 5 | 16 |
| Abdominal pain | 2 | 3 | 2 | 7 |
| Splenomegaly | 9 | 12 | 4 | 25 |
| Hepatomegaly | 7 | 8 | 5 | 20 |
| Altered consciousness | 0 | 3 | 2 | 5 |

**Table 1. Clinical profile of admitted patients by symptoms**

On noting history it was seen that recurrence had occurred in 12 patients. 2 cases of vivax malaria were found to be chloroquine resistant (no symptomatic relief even after 48 hours of chloroquine therapy).General physical signs on admission, 118(98.33%) cases had temperature, 15(12.5%) had icterus and 16 (13.33%) had pallor. Systemic examination revealed, splenomegaly in 25 (20.83%), hepatosplenomegaly in 20 (16.67%), hepatomegaly in10 (8.33%) and altered level of consciousness in5 (4.17%) in which two had mixed infection and three were found to have *P. falciparum*.

Raised erythrocyte sedimentation rate (ESR) in 71 (59.17%), anaemia in 24 (20%), leucopenia in 50 (41.67%), thrombocytopenia in 6 (5%), raised blood urea in15 (12.5%) and serum creatnine in 8 (6.67%) cases. Abnormal liver function test was observed in20 patients, raised direct and indirect bilirubin in 20(16.67%), serum glutamate oxaloacetate transaminase (SGOT) in 19(15.83%), serum glutamate pyruvate (SGPT) in 18 (15%) cases. Viral markers were negative. Urine analysis revealed proteinuria in12 (10%), granular cast in 4 (3.33%) cases. (Table 2)



 

| Laboratory parameter | Mean | Std. deviation |
|---|---|---|
| Hb (gm%) | 10.2 | 2.7 |
| TLC (cumm) | 8100 | 4200 |
| Platelet count (cu mm) | 180000 | 40000 |
| BUN (mg%) | 118 | 42 |
| Sr. creatinine (mg%) | 4.1 | 1.9 |
| Total bilirubin (mg/dL) | 7.1 | 2.8 |
| SGOT (U/L) | 96 | 22 |
| SGPT (U/L) | 102 | 22 |

**Table 2.Mean and standard deviation of laboratory parameters (n=120)**

| Drugs received | No. of patients | Percentage |
|---|---|---|
| Chloroquine | 98 | 81.67 |
| Primaquine | 120 | 100 |
| Artesunate | 38 | 31.67 |
| Artether | 22 | 18.33 |
| Sulfadoxine-Pyrimethamine | 46 | 38.33 |
| Quinine | 50 | 41.67 |

**Table 3. Treatment given to admitted patients (n=120)**

Inpatients had other associated diseases, like diabetes (4), hypertension (6), chronic obstructive pulmonary disease (COPD) (3), and ischemic heart disease (IHD) (4). Among the 120 patients, 112 (98%) improved and were discharged. Seven patients went against medical advice and one patient died due to cerebral malaria. A statistically siginificant number of ($p < 0.05$) patients received more than one antimalarial drug during their course in the hospital (Table3). If we look at overall number (outpatient and inpatient), *P. vivax* constituted 291 (70.97%) cases, *P. falciparum* constituted 106 (25.85%) cases and the rest were mixed malarial infection.

## 4. DISCUSSION:

This study was done retrospectively using hospital data and shows that males (68.53%) were affected more commonly as compared to females (31.47%). Most of the patients were between the age group of 15 and45yr, with most number of cases between the age group of21 and 30 yrs. The malaria incidence in this region is seasonal and the numbers of cases increase with the arrival of monsoon. The present results are in conformity with the incidence pattern as reported by earlier workers in different parts of India[2,3]. *P. vivax* was the major parasite species (70.97%), followed by *P. falciparum* (25.85%) and mixed infections (3.18%). The number of *P. falciparum* cases was relatively more in inpatients compared to outpatients. Fever is the most common symptom[2,4] and majority of the patients presented within a week of onset of symptoms (mean duration of 7 days). Clinical examination showed splenomegaly and hepatosplenomegaly and the severity of the disease with complications like hepatopathy, cerebral malaria etc. in this area which is a cause for concern. Such severe complications were also reported in several studies carried out in a tertiary care and referralhospitals[2,4-6]. Chloroquine and primaquine was the most preferred antimalarial combination due to high incidence of vivax species and the later drug was used against gametocytes in falciparum malaria[2,7]. A significant number of the patients received combination therapy. Malaria is a significant and serious health problem in Madhya Pradesh.

Due to rapid growth and development, recently there has been an increase in the incidence of malaria in this region which is due to construction boom and deforestation. This has created a major challenge for public health in the urban area. There is an increase in the number of malaria cases with the arrival of monsoon which is a matter of concern. Due to raising fear of resistance, multi drug approach has been tried and thereby has helped in preventing serious complications. In spite of advances in detection and management of malaria, deaths due to its complications are still unavoidable. The widespread use of vector control measures along with adequate and sustained surveillance will go a long way in prevention and control of malaria in the region.

## 5. REFERENCES:


1. World health Organization. Estimates for 2011-2012. WHO Global Malaria Report 2012:pg59
2. Muddaiah Madhu, Prakash P.S. A study of clinical profile of malaria in a tertiary referral centre in South Canara. *J Vect Borne Dis* March 2006; 43:29-33.
3. Madhavan KT, Jajoo UN, Bhalla A. Seasonal variation in the incidence and complication of malaria in central India. *Indian J Med Sci*2001; 55:43–6.
4. 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; 98: 160–2.
5. Patil V.C. Complicated falciparum malaria in western Maharashtra. *Trop Parasitol*2012; 2: 49-54.
6. Charulata Limaye, Vikram Londhey, ST Nabar. The study of complications of vivax malaria in comparison with falciparum malaria in Mumbai. *J Assoc Physicians India*2012; 60:15-18.
7. Kamtekar KD, Gogtay NJ, Dalvi SS, Karnad DR, Chogle AR, Aigal U, Kshirsagar NA. Prospective study evaluating the efficacy of a single, 45 mg dose of primaquine, as a gametocytocidal agent, in patients with *Plasmodium falciparum* malaria in Mumbai, India. *Trop Med Parasitol*2004; 98:453–6.


**Conflict of Interest: None Declared**

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