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**Original Research Article**

# Changing clinical profile of malaria at a tertiary care hospital

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## ABSTRACT

**Background:** There is a widespread range of diverse typical and atypical manifestations of malaria. The diagnosis of malaria may escape the attention of treating physician due to its unusual and vague presentations.The morbidity and mortality due to malaria is increased due to lack of early diagnosis and right treatment. The Aim of the present study was to examine the changing clinical pattern of malaria with special attention to atypical presentations.
**Methods:** The present study comprised of 630 cases of definitively diagnosed malaria.Diagnostic methods used were conventional thick and thin peripheral smear stained with Leishman stain and rapid malarial antigen test.
**Results:** This study revealed atypical symptoms like lack of taste (1.3%), throat discomfort (13.33%) and cough (24.0%) and vomiting (52.4%) as presenting complaints. These were significantly more in patients with P. vivax infestations.
**Conclusions:** A high degree of suspicion is necessary for early detection and treatment of malaria, especially of unusual presentations.

**Keywords:** Malaria, P. vivax, P. falciparum, Atypical presentation, Cough

## INTRODUCTION

Malaria remains a major public health problem in India and one of the most common parasitic infections. Lack of proper health infrastructure, inability to control the disease in endemic areas, and movement of the population are some of the factors responsible for failure to curb malaria.[1]

The malaria is classically characterized by fever with chills and rigors, occurring intermittently with splenomegaly and anaemia. Apart from this classical clinical presentation there may be involvement of central nervous system in cerebral malaria, gastrointestinal involvement in algid malaria, respiratory involvement in the form of acute pulmonary insufficiency.[2,3] Lactic acidosis, hypoglycaemia, haematological and coagulation abnormalities and other presentations are also known.

Today we have a widespread range of diverse typical and atypical manifestations of malaria. The diagnosis of malaria may escape the attention of treating physician due to its unusual and vague presentations. The morbidity and mortality due to malaria is increased due to lack of early diagnosis and right treatment.

Therefore, a high degree of suspicion is necessary for early detection, especially of unusual presentations.

The present study was undertaken to examine the changing clinical pattern of malaria with special attention to atypical presentations.

## METHODS

The present study comprised of 630 cases of definitively diagnosed malaria. A detailed clinical history regarding the type of fever and associated complaints was obtained. A thorough clinical examination was done with special consideration to organomegaly and end-organ damage was carried out.

### *Inclusion criteria*

- Patients attending outpatient department as well as inpatient department (both wards and intensive care unit).
- Both male and female patients between age group 14 years onwards.
- Patients with positive malarial smears (more than two), also patients with smear negative with positive rapid malarial antigen test.

### *Exclusion criteria*

- Smear negative patients for malarial parasite and negative rapid malarial antigen with fever with chills and rigors, inspite of clinical suspicion of malaria.
- Pregnant females.
- Patients with chronic systemic disorder like liver cirrhosis, immunocompromised individuals and patients on chemotherapy for malignancy.

Diagnostic methods used were conventional thick and thin peripheral smear stained with Leishman stain, examined under oil immersion.[4] The slide was considered negative when there were no parasites in 100 HPF. Rapid diagnostic tests were based on detection of specific plasmodium antigen, LDH (optimal test) for Vivax and HRP2 for falciparum.

Apart from peripheral blood film and rapid diagnostic test other lab investigations were undertaken like haemoglobin, total leucocyte count, platelet count, renal function tests, liver function test, blood sugar, blood urea, serum creatinine, other investigations needed for the patient. Other appropriate blood tests, CSF examination were done wherever needed.

## RESULTS

In present study, majority of cases were as result of Plasmodium falciparum infection.

Out of the total 630 patients, P.falciparum were 331(52.5%), P. vivax were 206 (32.6%), while patients with mixed malarial were 96 (14%).

Patients who presented with atypical clinical symptoms, in this study were many, though there was no statistical significance of any particular symptom group. However, we got a surprising number of patients with cough (24%) and throat discomfort (13.33%).

More than 50% patients presented with vomiting at time of presentation (52.4% p-value 0.146). In this study, the commonest typical presenting symptom wasfever (95.1%; p Value-0.235), followed by headache and bodyacheand then by rigors (83%).

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**Table 1: Atypical Presentations.**

| Symptoms | Falciparum (%) | Vivax (%) | Mixed (%) | Percentage | p Value |
|---|---|---|---|---|---|
| Apyrexia | 12 (3.6) | 12 (5.8) | 07 (7.4) | 4.92 | 0.505 |
| Lack of taste | 02 (6.2) | 05 (2.4) | 01 (1.1) | 1.3 | 0.183 |
| Throat discomfort | 38 (11.5) | 35 (17.0) | 11 (11.08) | 13.33 | 0.169 |
| Cough | 82 (24.8) | 47 (22.8) | 22 (23.07) | 24.0 | 0.872 |
| Abdominal pain | 87 (26) | 56 (27) | 30 (32.03) | 27.05 | 0.522 |
| Diarrhoea | 34 (10) | 27 (13) | 13 (14.0) | 11.74 | 0.47 |
| Vomiting | 173 (52.3) | 116 (56) | 41 (44) | 52.4 | 0.146 |
| Rash | 106 (32) | 63 (30.1) | 39 (36.6) | 32.2 | 0.588 |
| Urinary complaints | 116 (35) | 54 (26) | 29 (31) | 31.1 | 0.101 |

A large number of patientspresented with breathing difficulty (28.9%). As observed, splenomegaly (93.49%) and hepatomegaly (65.6%) were most commonly seen in patients with mixed malarial infestation.

Of the remaining anaemia (27.3%), jaundice (25.01%), dehydration (28.3%), convulsion (28.3%) and altered sensorium (27 %) were also noted. Lack of taste is more common in P. falciparum and mixed malaria (8%) than in P. vivax alone (p-Value 0.021). In the age group of 20-39 yrs there was more throat discomfort with P. falciparum as against the patient who had only P. vivax (p-Value - 0.010).

There was higher incidence of cough in patients of more than 60 yrs of age, who had P. falciparum infestation (p-Value 0.005).

**Table 2: Incidence of atypical symptoms according to malarial species.**

| Age (Years) | | Apyrexia (%) | Lack of taste (%) | Throat discomfort (%) | Cough (%) | Pain in abdomen (%) | Diarrhoea (%) | Vomiting (%) | Rash (%) | Urinary complaints (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| 14-19 (218) | P. Falci. + mixed | 65 (94.2) | 00 | 10 (14.5) | 18 (26.1) | 21 (30.4) | 8 (11.6) | 37 (53.6) | 21 (30.4) | 17 (24.6) |
| | P. vivax | 38 (90.5) | 00 | 7 (16.7) | 12 (28.6) | 12 (28.6) | 3 (7.1) | 21 (50) | 13 (31) | 14 (33.3) |
| | P-value | 0.462 | | 0.758 | 0.775 | 0.835 | 0.447 | 0.711 | 0.954 | 0.322 |
| 20-39 (287) | P. Falci. + mixed | 245 (95.7) | 2 (0.8) | 24 (9.4) | 60 (23.4) | 68 (26.6) | 30 (11.7) | 122 (47.7) | 82 (32) | 99 (38.7) |
| | P. vivax | 112 (95.7) | 5 (4.3) | 22 (18.8) | 24 (20.5) | 29 (24.8) | 19 (16.2) | 68 (58.1) | 39 (33.3) | 22 (18.8) |
| | P-value | 0.992 | 0.021 | 0.010 | 0.530 | 0.717 | 0.230 | 0.061 | 0.803 | 0.000 |
| 40-59 (105) | P. Falci. + mixed | 81 (95.3) | 1 (1.2) | 12 (14.1) | 21 (24.7) | 22 (25.9) | 8 (9.3) | 47 (55.3) | 34 (40) | 25 (29.4) |
| | P. vivax | 36 (92.3) | 0 | 4 (10.3) | 11 (28.2) | 13 (35.1) | 4(10.3) | 21 (53.8) | 9 (23.1) | 14 (35.9) |
| | P-value | 0.503 | 0.496 | 0.551 | 0.679 | 0.299 | 0.883 | 0.880 | 0.066 | 0.470 |
| >60 (20) | P. Falci. + mixed | 14 (100) | 00 | 3 (21.4) | 5 (35.7) | 6 (42.9) | 1 (7.1) | 8 (57.1) | 3 (21.4) | 4 (28.6) |
| | P. vivax | 8 (100) | 00 | 2 (25) | 0 | 2 (25) | 1 (12.5) | 6 (75) | 2 (25) | 4 (50) |
| | P-value | | | 0.848 | 0.054 | 0.402 | 0.674 | 0.402 | 0.848 | 0.315 |

## DISCUSSION

Malaria is the most ancient infection known to man. In India, many centuries ago, it was called the King of Diseases. There are many studies describing the changing clinical profile of malaria.[5-7] In the present study, a total of 630 patients were studied. We observed that nowadays malaria does not present with the typical scenario. Instead, there is a changing spectrum of clinical presentation. In India, 70% of cases occur as a result of P. vivax, 25% due to P. falciparum and 4-8% due to mixed malarial infection.[8] In this study, P. falciparum contributed to total of 53%, P. vivax contributed to 33% and mixed malarial infection was responsible to remaining of 14% of total study group. Kortepter et al studied 79 cases with 67% of patients with P. vivax infection and 22% with P. falciparum malarial infection.[9] Thus, while our study confirms with other similar studies regarding the increased incidence of P. falciparum, we got a slightly higher incidence of mixed malaria infestation.

Majority of studies have reported fever as a major clinical presenting feature. Patients presents with typical complaints of malaria such as fever, chills, rigors. headache and bodyache.[8]

Among 630 patients studied, 95.07% cases presented with fever (p-Value-0.235) 68.6% presented with chills (p-Value 0.46). 14.8% had (p-Value 0.88) rigors; 83.17% patients came with complaints of headache and bodyache (p-Value 0.88). Mehta SR reported 210 cases out of them 75 patients presented with fever.[10] Only 4.92% patients presented with apyrexia. Apyrexia at presentation were all seen in patients below the age of 60 years. In the age group of more than 60 years of age, all patients presented with fever. This finding has not been noted in any other study in Review of literature that we undertook. 83.17% of the patients gave history of headache and bodyache which was not responding to analgesics.

Such patients responded well to treatment of the malarial infection. Anecdotal observations have found this presentation to be more common in school going children. However, we did not find any specific age-group leaning in this regard. Kortepter et al reported an incidence of headache to an extent of 59%, which is lower than our study.[9]

The atypical clinical presentation of patients in this study was many, though none showed statistical significance. In this study, it was observed that few patients who were malaria smear positive also had complaints of lack of taste. We noted a total of 8 patients (1.3%) of which majority had P. vivax infection (6/8 patients). Lack of taste was found to be significantly increased in patients. However, lack of taste did not show any preference for the type malarial infestation.

Review of literature and journals did not reveal any study which had noted lack of taste as a significant presenting complaint. 84 patients (13.33%) presented with throat discomfort.

Overall, patients with P. falciparum infection (either singly or mixed) had higher incidence of throat discomfort. In the age group of 20-39 years throat discomfort in patients with P. falciparum was significantly higher as against the patient who had only P. vivax (p-Value -0.010).

In the present study, 151 (24%) patients had complaints of cough at presentation. The cough was usually non-productive and often present for days before presentation. It was more commonly observed with P. falciparum malaria (either singly or mixed) (68.87%). A significant finding was the higher incidence of cough in patients of P. falciparum infestation who were more than 60 years of age (p-Value 0.005). We wanted to ascertain whether the cough could be due to the seasonal (winter) throat infections we see. Analysis of the seasonal variation of cough in these patients, showed majority of these patients presented in monsoon months rather than in winter (28.68%). Cough has been found to be presenting feature of malaria, particularly P. falciparum malaria in another study.[11] Significant number of patients present with abdominal pain (173 patients; 27.46%). Out of which maximum cases observed with P. falciparum malaria (87 patients (26.03%). All patients with abdominal pain had associated diarrhoea and vomiting. The nature of pain was dull aching, diffuse all over the abdomen. The pain subsided with recovery from primary disease.

More than 50% patients presented with vomiting at time of presentation (52.4% p-value 0.146). All age groups had similar incidence of vomiting at the time of presentation. The type of infestation did not reveal any statistically significant difference, though more patients with P. vivax presented with vomiting. Surprisingly, fewer patients presented with vomiting in the monsoon months (37.56%). Kortepter et al in his study, reported an incidence of vomiting to an extent of 31%.[9]

Diarrhoea was present in 11.74% of patients. However, it was more common in P. falciparum infestations (63.51%) than in P. vivax only. Gastrointestinal symptoms in patients with malaria are well known. It has observed that malaria itself or malaria involving gastrointestinal tract leading to congestion of mucosa and sloughing of mucosa and haemorrhage or anti-malarial drugs. From our study group, rash all over the body was seen in 208 patients (32.2%) at the time of presentation. Of these maximum number are observed with P. falciparum (106 patients). Dermatological involvement in the form of urticarial rash with no previous history of such episodes has been reported.[12] The possible mechanism may be immunological involving both IgE in P. falciparum infections.

Since there are a large number of antigens, it is difficult to postulate which is responsible for triggering immunological mechanism.[13] Jain et al reported a case of P. falciparum malaria presenting as peripheral dry gangrene in consequence to disturbances of oxygen supply to the tissue.[6] However, in the present study, we have not seen any such cases. Urinary complaints commonly associated with P. falciparum malaria (31.06%). This compromised of yellowish discolouration of urine, cola coloured urine, decreased urinary output. Kortepteret al reported an incidence of dark urine to extent of 32%.[9] Thus, in view of common atypical presentations in malaria patients, a high degree of suspicion is necessary for early detection and treatment of malaria, especially of unusual presentations.

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