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Original Research Article

# Multi-center Observational analysis of Malaria over 7 years in the endemic area of Vijayapur in North Karnataka

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**Abstract:** The objective of present study is an analysis of the clinical profile of malaria with emphasis on complicated malaria cases in the two major tertiary referral medical college hospitals in the endemic area of Vijayapur over a period of 7 years. A total 210 cases presenting with fever from November 2009 to January 2016 were included in this study. All patients above 18 years with fever and proved to be having acute malaria via peripheral smear study, QBC test or pLDH antigen test positive for malarial parasite were included in this study. A total of 210 cases were diagnosed with malaria. 123 were male and 87 female. Complicated malaria was seen in 53 cases. 3 died with the overall mortality of 3.7%, causative organism in all being P. Falciparum. Mortality occurred in those admitted with multiple organ dysfunction syndromes. Rest of the patients were treated with anti-malarial agents with recovery. Chloroquine was used in those initially suspected as clinical malaria, followed by quinine or Artemisinin in confirmed cases. .Supportive management of complications such as coma, convulsions, metabolic acidosis, hypoglycemia, fluid and electrolyte disturbances, renal failure, secondary infections, bleeding disorders and anemia was done. P. falciparum was predominant cause of most complications. *P. vivax* also caused severe malaria complications. However the occurrence of multiple complications leads to higher mortality in the P. falciparum group. Hence, early detection with effective treatment should be the aim to reduce mortality and morbidity associated with malaria.
**Keywords:** Clinical profile; complicated malaria; Plasmodium falciparum; Plasmodium vivax.

## INTRODUCTION

The number of cases of malaria worldwide appears to be growing because of the increasing risk of transmission in areas where malaria control has declined (e.g. India), increasing prevalence of drug-resistant strains of parasites (e.g. chloroquine resistance)[1]. It is a curable disease if the patients have access to early diagnosis and prompt treatment [1]. Malaria is rampant in and around the Talukas of Vijayapur city.

Five human Plasmodium species (Plasmodium falciparum, *P. vivax*, *P. ovale*, *P. knowlesi*, and *P. malariae*) cause malaria infection. The major complications are caused by P. falciparum and *P. vivax*, with *P. falciparum* being the more virulent. The first symptoms of malaria, common to all the different malaria species, are nonspecific and mimic a flu-like syndrome [2]. Malaria most commonly presents as an "acute febrile illness". Although fever is a cardinal feature, clinical presentations in malaria are widely variant and non- specific ranging from fever, malaise, headache, myalgia, jaundice, nausea, vomiting and even diarrhea to serious complications causing death, especially in falciparum malaria. The progression from simple fever to complicated malaria can be very rapid; any patient with malaria must be assessed and treated on an urgent basis.

Identification of the parasite under microscopy is the ideal method; however it needs specialized staff with proper technical expertise. Pockets of resistance to antimalarial drugs are commoner in such settings [3, 4]. Resource-poor settings still depend on clinical diagnosis and presumptive antimalarial therapy.

Our aim was to increase the identification of malaria as a cause for acute febrile illness and the features that distinguish simple from complicated malaria.

## MATERIALS AND METHODS

210 cases presenting with fever from November 2009 to January 2016 were included in this study. WHO definition of cerebral malaria was used to define complicated malaria. Data was analyzed by proper statistical tests i.e. t test, chi square test and standard deviation.

### Inclusion criteria

All patients above 18 years with fever and proved to be having acute malaria via peripheral smear study, QBC test or pLDH antigen test positive for malarial parasite were included in this study.

### Exclusion criteria

Cases that have undergone treatment before giving a blood sample and cases where only gametocyte is seen in peripheral smear and patient has no history of fever were excluded from this study.

## RESULTS:

A total of 210 cases were analyzed from November 2009 to January 2016. The mean age of patients was 42 years. The study saw a distribution of malaria in 58.5% males and 41.4% females (Table 1). Typical paroxysms were observed in 68.2 % patients of *P. vivax* and 51.8% patients of P. Falciparum. Atypical manifestations like vomiting, headache, jaundice, altered sensorium & pain in the rest. The commonest atypical symptom was headache and vomiting. 72 (34.2%) patients were identified to have *P. vivax*, 116 (54.2%) with P. falciparum and 6 cases of mixed malaria. (*P. vivax* with P. falciparum) (Table 2).

**Table-1: Age & Sex Distribution**

| Age in years | Number | % | Sex | Number | % |
|---|---|---|---|---|---|
| **21-30** | 84 | 40.0 | **Male** | 123 | 58.5 |
| **31-40** | 45 | 21.4 | **Female** | 87 | 41.4 |
| **41-50** | 39 | 18.5 | | | |
| **51-60** | 30 | 14.2 | | | |
| **61-70** | 12 | 5.7 | | | |
| **Total** | 210 | 100.0 | **Total** | 210 | 100.0 |
| **Mean ± SD** | 42 ± 26.5 | | | | |

**Table-2: Type of Species**

| Type of species | Number (n=210) | % |
|---|---|---|
| ***P. falciparum*** | 72 | 34.2 |
| ***P. vivax*** | 114 | 54.2 |
| **Mixed** | 6 | 2.8 |

**Table 3: WHO guidelines for complicated malaria**

| Criteria | Number of Patients (n=210) | Species | | |
|---|---|---|---|---|
| | | P. Falciparum | *P. vivax* | Mixed |
| **Hb<5 gm/dl** | 42(20%) | 36 (85.7%) | 6 (14.2%) | - |
| **S.Creatinine >3mg%** | 21(10%) | 12 (57.1%) | 6 (28.5%) | 3(14.2%) |
| **T.Bilirubin(>3 mg/dl)** | 33(15.7%) | 27 (81.3%) | 3(9.1%) | 3(9.1%) |
| **M.acidosis.ph<7.2** | 36(17.1%) | 24 (66.6%) | 6(16.6%) | - |
| **Bleeding and DIC** | 3(1.42%) | 3(100%) | - | - |
| **Coma >30min** | 12(5.7%) | 12(100%) | - | - |
| **Hyperparasitemia>5%** | 15(7.1%) | 9(60%) | - | 6(40%) |
| **B.sugar<40mg%** | 42(20%) | 27(64.2%) | 12(28.5%) | 3(7.4%) |
| **Prostration** | 36(17.1%) | 24(66.7%) | 6(16.7%) | 6((16.7%) |
| **ARDS** | 24(11.4%) | 18 (75%) | 6(25%) | - |
| **Systolic BP<80mmhg** | 18(8.5%) | 9(50%) | 9 (50%) | - |

**Table 4: Type of Malaria**

| Type of malaria | Number (n=210) | % |
|---|---|---|
| **Uncomplicated Malaria** | 157 | 74.7 |
| **Complicated Malaria** | 53 | 25.2 |

**Table 5: Association of Species with outcome**

| Species | Outcome | | Number of patients |
|---|---|---|---|
| | Died | Recovered | |
| **P. Falciparum** | 3 (3.7%) | 78(96.2%) | 81 |
| ***P. vivax*** | - | 105(100.0%) | 105 |
| **Mixed** | - | 6(100.0%) | 6 |
| **Total** | 3(1.5%) | 189 (98.4%) | 192 |

According to the revised WHO guidelines of 2000 patients were grouped into complicated and uncomplicated. In our study 53 cases had complicated malaria and 157 cases had uncomplicated malaria. In complicated malaria 42 patients had Hemoglobin <5gm% of which 85.7% were *P. falciparum* and 14.2% were *P. vivax*, 7 patients had S. Creatinine >3mg% in which 57.1% were *P. falciparum* and 28.5% were *P. vivax*, 11 patients had T. Bilirubin >3mg% in which 81.3% were *P. falciparum*, 9.1% were P vivax and 9.1% mixed; 12 patients had metabolic acidosis (ph. <7.2), 66.6% were *P. falciparum* and 16.6% were *P. vivax*,. 100% *P. falciparum* patient had spontaneous bleeding with DIC , 4 patients had coma for > 30min, in which all 4 were *P. falciparum*, 5 patients had hyperparasitemia in which 60% in *P. falciparum* and 40% in mixed, 14 patients had hypoglycemia in which 64.2% were *P. falciparum*, 28.5% were *P. vivax*, 7.4% was mixed infection. 12 patients had prostration in which 66.7% were *P. falciparum*, 16.7% *P. vivax* and 16.7% mixed, 8 patients had ARDS in which 75% were *P. falciparum* and 25% were mixed, 6 patients developed shock in which 50% were *P. falciparum*, and 50% were *P. vivax*. (Table 3).

In total, 157(74.7%) patients had uncomplicated malaria and 53(25.2%) patients had complicated malaria. (Table 4) .Complications was commonly seen in *P. falciparum* compared to *P. vivax* of which anemia, hypoglycemia and hyperbilirubinemia being the most common. Out of 210 cases 3 died with the overall mortality of 3.7%; all of whom were P. falciparum infection. (Table 5).

## DISCUSSION

In 2015, the World Health Organization (WHO) set an ambitious new target of reducing the global malaria burden by 90 % by 2030, and encouraged nation members to fulfill the goal of malaria elimination [5]. Although the prevalence of malaria has been showing declining pattern in some parts of India, there are many pockets where the reach of medical services is poor and incomplete therapy is rampant. Resistance to drugs occurs commonly in such settings.

The World Health Organization (WHO) defined criteria for diagnosis of severe complicated malaria help in identification of severe malaria. In clinical settings, presentation of a patient with suspected malaria who demonstrates complicated disease, i.e. prostration, any impairment of consciousness, convulsions or any manifestation of shock, decreased urinary output, respiratory distress or abnormal bleeding should be treated with parenteral rather than oral drugs, since deterioration can occur rapidly and without warning. We aimed to analyze 210 cases in respect of clinical presentation by routine microscopic methods and the immune assay techniques namely pLDH antigen detection for rapid P. falciparum and *P. vivax* detection.

Younger patients were predominant in our study. The mean age of patients was 42 years. Myriam Arévalo-Herrera, Mary Lopez-Perez, Luz Medina *et al.;* [8] in a study titled Clinical profile of Plasmodium falciparum and Plasmodium vivax infections in low and unstable malaria transmission settings of Colombia; found a significant proportion of the malaria cases (40.3%) occurred in the economically active population (16–30 years of age) [7]. This is in concordance with our study.

In our study, we observed male preponderance. This is in agreement with most studies on malaria because the outdoor exposure is higher in males. Wasnik Pn1, Manohar Tp, *et al.;* in their Studyof Clinical Profile of Falciparum Malaria in a Tertiary Referral Centre in Central India found similar results [6]. In our study we had 72 cases of *P. vivax*, 116 cases of P. falciparum and 6 cases of mixed malaria. (*P. vivax* with P. falciparum).

Fever was the most common presentation in our study. Complications occurred in both P. falciparum and *P. vivax* groups. Shubhanker Mitra, Abhilash KPP *et al.;* found that the spectrum and degree of hematological, hepatic, renal, metabolic, central nervous system complications of vivax malaria was not different from that of falciparum group. The clinical features, complications and case-fatality rates in vivax malaria can be as severe as in falciparum malaria. They conclude vivax malaria could not be considered benign [9].

In our study, complications were commonly seen in *P. falciparum* compared to *P. vivax* of which anemia, hypoglycemia and hyperbilirubinemia being the most common. Out of 210 cases 3 died with the overall mortality of 3.7%; all of whom were P.

falciparum infection. The occurrence of multiple complications could have leadto the higher mortality in the P. falciparum group. In a study on Malaria: incidence, clinical profile, complications, treatment options from a rural medical college hospital in south India; Nanjundaiah, N *et al.;* comment that " Any case of fever is malaria until proven otherwise: still holds true in India!". They noticed a shift in the clinical profile in patients with complicated malaria has been observed with multiple organ dysfunctions becoming a common feature [7]. This is in agreement with our study.

Shubhanker Mitra, Abhilash KPP *et al.;* found that the spectrum and degree of hematological, hepatic, renal, metabolic, central nervous system complications of vivax malaria was not different from that of falciparum group. The clinical features, complications and case-fatality rates in vivax malaria can be as severe as in falciparum malaria. They conclude vivax malaria could not be considered benign [9]. Early detection with effective treatment should be the aim to reduce mortality and morbidity associated with all types of malaria.

## CONCLUSION

P. falciparum was predominant cause of most complications. *P. vivax* also caused severe malaria complications. However the occurrence of multiple complications leads to higher mortality in the P. falciparum group. Hence, early detection with effective treatment should be the aim to reduce mortality and morbidity associated with malaria.

### Contributors

Dr Nijora is the corresponding author and guarantor for this study. Dr Satish is the co-author.

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**Conflict of Interest** – None

## REFERENCES

1. Pasvol G; The treatment of complicated and severe malaria Br Med Bull 2005; 75(1): 29-47.
2. Bartoloni A, Zammarchi L; Clinical Aspects of Uncomplicated and Severe Malaria. Mediterranean Journal of Hematology and Infectious Diseases. 2012; 4(1):e2012026.
3. Peter G, Manuel A.L, Shetty A; Study comparing the clinical profile of complicated cases of plasmodium falciparum malaria among adults and children. Asian Pacific Journal of Tropical Disease, 2011; 1(1): 35-7.
4. Sachin W Patil, Lata B Godale; Mortality Pattern of Hospitalized Children in a Tertiary Care Hospital in Latur: A Record Based Retrospective Analysis. National Journal of Community Medicine, 2012; 3(1):96-100.
5. World Health Organization. Global Technical Strategy for Malaria 2016–2030. Geneva: WHO. Available at http://www.who.int/malaria/areas/global_technical_strategy/en/
6. Wasnik PN, Manohar TP, Humaney NR, Salkar HR; Study of Clinical Profile of Falciparum Malaria in a Tertiary Referral Centre in Central India. J Assoc Physicians India. 2012; 60:33-6.
7. Nanjundaiah N, Reddy P.K, Reddy Y.J.V; Malaria: incidence, clinical profile, complications, and treatment options: study from a rural medical college hospital in south India. (Any case of fever is malaria until proven otherwise: still holds true in India!). International Journal of Infectious Diseases, 2012; 16: e168-e169.
8. Arévalo-Herrera M, Lopez-Perez M, Medina L, Moreno A, Gutierrez J.B, Herrera S; Clinical profile of Plasmodium falciparum and Plasmodium vivax infections in low and unstable malaria transmission settings of Colombia; Malaria Journal, 2015; 14:1.
9. Mitra S, Abhilash K.P.P, Arora S, Miraclin A; A prospective study from south India to compare the severity of malaria caused by Plasmodium vivax , *P. falciparum* and dual infection; J Vector Borne Dis, 2015; 52(4): 281.