

## A Retrospective Single Centre Study of Analysis of Clinical Profile and Prescription Pattern of Malaria in a Tertiary Care Hospital

Dr.Reena Jha<sup>1</sup>, Dr.Balram Jha<sup>2\*</sup>

<sup>1</sup> Assistant Professor, Department of Pharmacology, M.G.M Medical College, Jamshedpur

<sup>2\*</sup> Associate Professor, Department of General Medicine, M.G.M Medical College, Jamshedpur

Corresponding Author: Dr.Balram Jha

**Abstract: Introduction:** Malaria is a disease caused by infection with single celled protozoan parasite of the genus plasmodium and five plasmodium species are known to infect humans-*P. falciparum*, *P. vivax*, *P. ovale*, *P.knowlesi* and *P. malariae*. Of these, majority of cases reported are due to infection with *P. falciparum* and *P. vivax*. *P. falciparum* is associated with the most severe form of the disease.

**Materials and methods:** This was a hospital-based, single-center retrospective surveillance study analysing the records of patients admitted with the diagnosis of Malaria and patients attended the OPD of medicine from Jan 2018 to June 2018 in a tertiary care center.

The information relating to patient age, gender, Mode of diagnosis, Lab reports and prescribing pattern of anti-malarial drugs were extracted and analyzed.

Patient of either sex aged above 18 years who were diagnosed as malaria either by rapid diagnostic tests (RDT) or peripheral smear test was included in the study. Patients presenting with a history of fever but their peripheral smear and rapid diagnostic test negative, still empirically treated with antimalarials were excluded from the study. patients aged below 18 years were also excluded from the study. Patients presented with symptoms mimicking malaria-like sepsis, dengue fever, leptospirosis were excluded.

**Results:** Among 100 patients, 26 were infected from *P. falciparum*, 49 from *P. vivax* and 25 had mixed infection (Table 2). All 65 patients presented with a history of fever which was statistically highly significant. Headache and malaise were seen in 32 and 21 patients respectively. Anemia was a major sign in 19 patients and around 17 patients complained of vomiting. Jaundice and seizure were rarely seen in 6 and 3 patients respectively.

**Conclusion:** Malaria is still at rampant in India with debilitating morbidity and mortality. Studying the clinical profile of malaria with proper antimalarial drug treatment helps to curb down the complications of malaria. Every healthcare facility should follow national and international guidelines and form its in-hospital guidelines regarding proper antibiotic and antimalarial selection. This helps to reduce morbidity and mortality of malaria and helps in the sustained economic growth of the nation. Malaria is a completely curable disease.

**Key Words:** Malaria, *P. falciparum*, *P. vivax*, *P. ovale*, sepsis, dengue fever, leptospirosis

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### I. Introduction

Malaria is a disease caused by infection with single celled protozoan parasite of the genus plasmodium and five plasmodium species are known to infect humans-*P. falciparum*, *P. vivax*, *P. ovale*, *P.knowlesi* and *P. malariae*. Of these, majority of cases reported are due to infection with *P. falciparum* and *P. vivax*. *P. falciparum* is associated with the most severe form of the disease.<sup>1</sup> The transmission of the malaria infection occur via the bite of plasmodium-infected female anopheles mosquito. The infective form is sporozoite which passes through pre-erythrocytic phase in liver followed by erythrocytic phase in red blood cells; the latter is responsible for clinical manifestation of malaria.<sup>2</sup>

Malaria continues to be a major public health hazard and malaria caused by *P. falciparum* is the main culprit for almost all severe cases of malaria and deaths due to malaria in India. *P. vivax* is the next major species causing mainly a febrile illness and rarely leads to severe disease. In 2012, *P. falciparum* accounted for more than 50% cases and killed 519 people in India with annual parasite index (API) of 0.884.5 Recently due to effective interventional programs, there was a dramatic reduction in the number of cases.<sup>3</sup>

The emergence of complications like thrombocytopenia with malaria due to *P. vivax* has changed the dimensions in the treatment of malaria. Drug resistance in the treatment of malaria is due to ineffective and inappropriate prescribing practices. Under dosing or overdosing of anti-malarial drugs leads to an increase in drug resistance and leads to treatment failure and an increase in morbidity and mortality from malaria.<sup>4</sup>

Increase in the presentation of malaria cases with atypical symptoms further leads to delay in diagnosis, treatment of malaria which in turn leads to increase in morbidity and mortality and also increase in the number of cases of complicated malaria. The current study was conducted to study the clinical profile and prescription pattern of malaria in a tertiary care hospital.<sup>5</sup>

## II. Materials And Methods

### Study design

This was a hospital-based, single-center retrospective surveillance study analysing the records of patients admitted with the diagnosis of Malaria and patients attended the OPD of medicine from Jan 2018 to June 2018 in a tertiary care center.

The information relating to patient age, gender, Mode of diagnosis, Lab reports and prescribing pattern of anti-malarial drugs were extracted and analyzed.

### Study criteria

Patient of either sex aged above 18 years who were diagnosed as malaria either by rapid diagnostic tests (RDT) or peripheral smear test was included in the study. Patients presenting with a history of fever but their peripheral smear and rapid diagnostic test negative, still empirically treated with antimalarials were excluded from the study. Patients aged below 18 years were also excluded from the study. Patients presented with symptoms mimicking malaria-like sepsis, dengue fever, leptospirosis were excluded.

### Source of data

- Case sheets of inpatients diagnosed and admitted with malaria
- OPD cards of patients with a probable diagnosis of malaria visiting the department of medicine in a tertiary care hospital, M.G.M Medical College, Jamshedpur.
- Lab reports of malaria patients

Statistical analysis of this study Percentage analysis was done using Microsoft Excel.

## III. Results

On the basis of our inclusion and exclusion criteria, 100 patients who attended our OP and IP department and diagnosed with malaria were considered for our study.

Out of 100 patients taken, 65 were males and 35 were females. Many of the patients were between the age group of 30-49 years (Table 1).

Characteristics	N=100
Gender	
Male	65
Female	35
Geographical Distribution	
Rural	79
Urban	21
Age group (in years)	
18-30	22
31-50	36
51-60	19
65 and above	23

**Table 1:** Demographic details of patients

Species	No of patients (N=100)
<b>Plasmodium Vivax</b>	49
<b>Plasmodium falciparum</b>	26
<b>Mixed infection</b>	25

**Table 2:** Details of microbiological diagnosis of patients

Signs and Symptoms	No of patients
<b>Fever</b>	65
<b>Vomiting</b>	17
<b>Malaise</b>	21
<b>Anemia</b>	19
<b>Headache</b>	32
<b>Gastritis</b>	4
<b>Jaundice</b>	6
<b>Diarrhoea</b>	4

Seizure	3
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**Table 3:** Signs and symptoms of malaria patients in this study

Among 100 patients, 26 were infected from *P. falciparum*, 49 from *P. vivax* and 25 had mixed infection (Table 2). All 65 patients presented with a history of fever which was statistically highly significant. Headache and malaise were seen in 32 and 21 patients respectively. Anemia was a major sign in 19 patients and around 17 patients complained of vomiting. Jaundice and seizure were rarely seen in 6 and 3 patients respectively (Table 3).

Drugs	Number of Patients	Percentages
Artesunate	23	15.21%
Chloroquine	34	24.11%
Quinine	4	2.9%
Arteether	6	4.2%
Primaquine	46	32%
Artemether	19	13%
Sulfadoxine-Pyrimythamine	13	9.25%
Total	145	

**Table 4:** Antimalarial drugs prescription details

Parenteral drugs were less commonly prescribed in the treatment of malaria cases compared to oral drugs. Out of 145 prescriptions generated during the study period, chloroquine and primaquine shared major part followed by artesunate. Quinine was the least commonly prescribed drug in the treatment of malaria. (Table 4).

#### IV. Discussion

Our study showed males (70.69%) were more commonly affected by malaria compared to females (29.31%). *P. vivax* accounted for 38 cases (65.5%) whereas *P. falciparum* was found in only 8 patients (13.7%). 12 patients (20.6%) showed a mixed infection with both *P. vivax* and *P. falciparum*. But according to National Vector-borne disease control program (NVBDCP) states, *P. falciparum* constitutes the majority of disease burden in India (65%), this may be due to a variety of causes like geographical differences and climatic changes, etc. Many studies done here clearly shows a preponderance of *vivax* over *falciparum* in Karnataka.<sup>6</sup>

Another 2 patients developed hepatic dysfunction characterized by raised liver enzymes (ALT and AST), hyperbilirubinemia (Jaundice) and disorientation. Intravascular hemolysis of parasitized red blood cells is the main reason for jaundice and hepatic dysfunction. But there are some reports suggesting direct hepatic injury, sometimes referred to as "Malarial hepatitis" may also cause hepatic dysfunction.<sup>7</sup>

One patient in our study presented with acute renal failure (ARF) symptoms like rise in blood urea and creatinine.<sup>8</sup> ARF can occur due to multiple reasons. The major mechanism responsible for the development of ARF is hemolysis of parasitized RBCs along with jaundice and disseminated intravascular coagulation. The activation of endothelium leads to the release of several vasoactive mediators like cytokines and interferon's which leads to a decrease in renal blood flow and finally renal ischemia and acute renal failure.<sup>9</sup> Volume depletion due to severe vomiting and hypotension may also have a significant role to play in the development of ARF in malaria.<sup>10,11</sup>

#### V. Conclusion

Malaria is still at rampant in India with debilitating morbidity and mortality. Studying the clinical profile of malaria with proper antimalarial drug treatment helps to curb down the complications of malaria. Every healthcare facility should follow national and international guidelines and form its in-hospital guidelines regarding proper antibiotic and antimalarial selection. This helps to reduce morbidity and mortality of malaria and helps in the sustained economic growth of the nation. Malaria is a completely curable disease.

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