

## **Study of Complications of Plasmodium Falciparum Cases Admitted In Medicine Department of A Tertiary Care Hospital, Ranchi, Jharkhand.**

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### **I. Introduction**

Malaria is a protozoal disease transmitted by bite of female anopheles mosquitoes. Six species of genus plasmodium causes nearly all malarial infection in human which include P.falciparum, P.vivax, two morphologically identical sympatric species of P.ovale, P.malariae, and P.knowlesi. Out of which most deaths are caused by P.falciparum. [1]

### **II. Problem Statement:**

WHO estimated in 2015, there were 214 million cases of malaria worldwide resulting in 4,38,000 deaths. India contributes to 61% of malaria cases and 41% of malaria deaths in SEAR countries. [2]

According to NVBDCP research pre independence estimates of malaria were about 75 million cases and 0.8 million deaths annually. Problem eventually eliminated in the mid-60s but the resurgence led to annual incidence of 6.47 million cases in 1976. MPO was launched in 1977 and annual malaria incidence started declining. The cases were contained between 2-3 million annually till 2001. Afterwards, this further started declining. During 2014 (till October) total 0.85 million cases, 0.54 million cases of P.falciparum and 316 deaths have been reported. [3]

About 92% of malaria cases and 97% of deaths due to malaria is reported from N-E states, Chhattisgarh, Jharkhand, M.P, Odisha, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, West-Bengal, and Karnataka. [4]

In 2012; 1,31,476 confirmed malaria cases which came down to 97,786; 1,03,735; 90,251 in 2013, 2014, 2015 respectively. In 2016 (till January) 5,344 cases of malaria reported in Jharkhand. [5]

### **LIFE CYCLE**

Malaria parasite enter human during blood meal of female anopheles mosquitoes and carried via blood stream to the liver, infected liver cells burst discharging many motile merozoites into the blood stream which eventually infects RBC and then transforms into trophozoites -> mature schizont, the RBC ruptures to release 6-30 daughter merozoites, each potentially capable of invading new RBC and repeating the cycle.[1]

### **COMPLICATIONS of Falciparum MALARIA**

Unarousable coma/cerebral malaria, acidosis, severe normochromic/normocytic anaemia, renal failure, pulmonary oedema, hypoglycaemia, shock, bleeding/DIC, convulsion, algid malaria, septicemia malaria.[1][6]

### **NEED FOR STUDY**

Jharkhand is among the states which has high prevalence of malarial cases. It has large forest cover and larger tribal population who live in rural areas with low socio-economic status and decreased awareness and hence poor preventive measures. This study is an attempt to access the pattern of complications of Plasmodium falciparum malaria and to see its associations with other socio-demographic factors. A good example of control of malaria is Sri Lanka which has completely eradicated malaria in 2016

### **AIMS AND OBJECTIVES**

1. To describe socio-demographic profile of patients.
2. To find out the risk behaviours associated with P.falciparum malaria.
3. To study the various complications of P.falciparum malaria.
4. To assess the outcome of complicated P.falciparum cases of malaria.

### III. Material And Methods

**STUDY DESIGN:** Hospital based, prospective study.

**PLACE OF STUDY:** Medicine Department, RIMS, Ranchi.

**DURATION OF STUDY:** 12 weeks (September 2016-November 2016)

**STUDY POPULATION:** Study was done on admitted cases of patients above 18yrs suffering from P.falciparum malaria who have been confirmed either by peripheral blood film or rapid diagnostic tests in Medicine Department of RIMS.

**INCLUSION CRITERIA :**All malaria cases satisfying at least one or more parameters of criteria such as unconsciousness, convulsions, high grade fever, anaemia, shock, increased serum creatinine and urea, oliguria, jaundice, hepatomegaly, splenomegaly, vomiting, abdominal pain, bleeding from abnormal site, headache were considered as complicated malaria cases.

**Respondent:** In unconscious and severely ill non co-operative patients respondent were their attendants.

**SAMPLING PROCEDURE:** Every consecutive case satisfying the inclusion criteria was studied.

**SAMPLE SIZE:** 52 cases studied during the time period.

**METHODS OF DATA COLLECTION:** A pre-tested semi-structured questionnaire was used to collect data from patient of complicated malaria based on

- i.Socio-demographic profile
- ii.Risk behaviours associated with complicated P.falciparum malaria
- iii.Complications associated with P. falciparum malaria.
- iv.Outcome of complicated P.falciparum cases.

Informed consent was taken from the patients.

**VARIABLES:** Age, Sex, Religion, Tribal/ Non- Tribal, Occupation, Education Status, Nuclear/ Joint Family, Socio-economic Class, Risk Behaviour, Housing conditions, Complications and Outcome.

**DATA ANALYSIS:** Template was generated in MS-Word sheet and data analysis was done in SPSS software.

**ETHNIC CONSIDERATION:** purpose of seeking information was explained in detail and verbal consent was taken from each before interviewing. Confidentiality of data was maintained.

### IV. Results

Age (in years)	Frequency	Percentage
18-30	23	45.83%
31-45	15	29.16%
46-60	10	20.8%
>60	4	8.3%
<b>Gender</b>		
Male	38	73.07%
Female	14	26.93%
<b>Religion</b>		
Hindu	25	48.07%
Sarna	14	26.93%
Muslim	10	19.23%
Christian	3	5.77%
<b>LOCALITY</b>		
Urban	13	25%
Rural	39	75%
<b>ETHNICITY</b>		
Tribal	28	54.2%
Non-Tribal	24	45.83%
<b>OCCUPATION</b>		
Agriculture	12	20.8%
Student	4	8.3%
Unemployed	2	4.1%
Retired	2	4.1%
House wife	4	8.3%
Govt/private jobs	9	16.6%
Driver	11	20.8%
Others	7	12.5%
<b>EDUCATION</b>		
Illiterate	11	20.83%
Secondary	15	29.16%
Primary	17	33.33%
Graduate/ PG	9	16.6%
<b>FAMILY TYPE</b>		
Nuclear	30	58.33%
Joint	22	41.67%

SOCIO ECONOMIC CLASS(B.G.PRASAD)		
Class I	7	12.5%
Class II	7	12.5%
Class III	15	29.16%
Class IV	15	29.16%
Class V	8	16.66%

Majority of the patients belong to age group 18-30 years (45.83%). Of total around 3/4<sup>th</sup> were males mostly Hindus residing in rural areas. Most of them had education till primary level. Most of them had nuclear family and were of low socio-economic status.

#### Assessment of risk behaviour pattern:

Risk behaviour pattern of the patients		
Wanderer	7	12.5%
Sleeping outdoor	15	29.16%
Blood transfusion	2	4.1%
Not specified	28	29.16%
Use of bed nets		
Used	22	41.6%
Not used	30	58.3%
Water logging present in surrounding areas		
Present	28	54.6%
Absent	24	45.8%
Spraying of insecticides done		
Done	9	16.66%
Not done	43	83.3%

Table 3: Showing complications in patients of Falciparum Malaria		
Cerebral malaria	12	23.07%
Anaemia	31	59.6%
Acute Renal Failure	22	42.3%
ARDS	3	5.7%
Jaundice	19	36.5%
Algid Malaria	12	23.07%
Septicaemia	2	3.8%

Amongst the patient the most common complication was anaemia (60%) followed by renal failure (42.8%) and least was septicaemia (2.5%).

Table 4: Showing outcome of the disease.		
Outcome	Frequency	Percentage
Discharged on advice	21	40.38%
Left against medical advice	13	25%
Developed further complications	4	7.69%
Death	14	26.92%
Causes of death		
Cerebral Malaria	5	35.7%
ARDS	2	14.28%
ARF	7	50%

Most of the patients were discharged on advice (40%) and few developed further complications (7.69%). ARF was the major cause of death.

#### V. Discussion

In our study of 52 patients of complicated P. falciparum malaria in Medicine Department of R.I.M.S, 73.07% patients were males, 75% patients resided in rural areas and 54.2% patients were tribals. According to a study done by Dr. T. V. Seshu babu et al, males comprised 72% of the total cases.

As per our study, 60% patients were anaemic, 42.8% had ARF, 36% had jaundice and 24% had cerebral malaria. In the study by Dr. T.V. Seshu babu et al 62.8% patients were anaemic, 36% had ARF and 37% had cerebral malaria. In another similar study by Sudha Rani et al, anaemia was present in 84% cases, 78% had ARF while 37.33% had features of cerebral malaria. Hence, mortality was seen to be associated more with renal failure and cerebral malaria.

#### VI. Conclusion

In our study out of 52 cases, age group 18-30 year, males and Hindus were mostly affected. People dwelling in rural areas were found to be more prone to malaria owing to different reasons such as water logging

in and around the living areas, habit of sleeping outside and less use of repellents and insufficient spraying of insecticides.

Two-thirds of the patients were tribal as because in the study majority of the patients were from rural areas. Jharkhand being a tribal dominant state, majority of rural population are tribals. Farmers and drivers were more in number to be affected. Patients mainly had primary level of education and belonged to nuclear family.

The risk behaviors in most of the patients were not specified but it was found that wanderers and those sleeping outside were prone to develop malaria. More than half had water-logging around their houses and workplaces.

The most common complication amongst the patients was anemia associated with renal failure and jaundice. Around half of the patients were discharged on advice and around a fourth of them died. Cerebral malaria, ARDS and ARF were the major causes of death.

## **VII. Recommendations**

People have to be made conscious about the disease malaria, its severity, and its control through ICE (Information, Communication and Education).

Importance of source reduction and its role in controlling mosquito vector, along with other disease should be explained to the people.

Awareness Programs have to be implanted more intensely giving special attention in the rural areas.

Better health facilities need to be provided in the remote areas.

Bed nets should be made available to low socio-economic classes at lower prices.

Importance need to be given to early diagnosis and complete treatment of malaria cases which will reduce the burden of complicated malaria.

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