

A RETROSPECTIVE STUDY TO DETERMINE THE CASES OF MALARIA AT RAIGARH DISTRICT, CHHATTISGARH- AN OBSERVATIONAL ANALYSIS

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Abstract

Background: Malaria remains the most important disease responsible for causing great suffering and loss of life in the world. The rationale behind the present study was to determine the proportion of Malaria and compare the record data.

Objectives: To determine the prevalence of Malaria and to compare the prevalence sex wise, age wise and to investigate which species is prevalent in Raigarh.

Material & Methods: Retrospective record-based study was done where the data from January 2009 to December 2018 was gathered and analyzed. Prevalence was calculated and Epi-info (7.0) software was used.

Results: 79218 blood smears prepared in 10 years in which 2911 smear were positive which indicates around 3.67% cases were positive. The Prevalence rate is falling with increasing years which indicates the importance of Malaria eradication programme. Positive cases were found to be highest under 10 years (46.58%). Male preponderance and Plasmodium falciparum is the most common species.

Conclusion: Health education through IEC (Information, Education and Communication) activities and behavioural change communication (BCC) are very important intervention measures aimed at improvement of environmental sanitation and personal protection from mosquito bites for the elimination of malaria in the endemic areas as well as in the whole country.

Keywords: Malaria, prevalence, plasmodium falciparum

INTRODUCTION:

Malaria remains the most important disease responsible for causing great suffering and loss of life in the world. Details of this disease can be found even in the ancient Indian medical literature like the Atharva Veda and Charaka Samhita. At present, official figures for malaria in India, available at NVBDCP¹ indicate 0.7–1.6 million confirmed cases and 400-1,000 deaths annually.² The biggest burden of malaria in India is borne by the most backward, poor and remote parts of the country, with >90-95% cases reported from rural areas and <5-10% from urban areas. Incidence of Malaria in India total cases 1.07 million, plasmodium falciparum 70 million. The common symptoms are high fevers and chills in human beings. The parasite is transmitted from an infected person to the other person, by the bites of certain female Anopheles mosquitoes which feed on the red blood cells at night. The World Health Organization reported 219 million cases of malaria with an estimated 660,000 deaths. South East Asia is the second most affected region in the world after Africa, and India has the highest (61%) malaria burden in the region with an estimated 24 million cases per year. Plasmodium falciparum malaria continues to be a major public health threat in India, with nearly half (273 million) of the high-risk population outside Africa residing in India¹. India contributes over one fifth (22.6%) of clinical episodes of P. falciparum globally.² The NVBDCP Epidemiological report of 2013–14 was also reported the prevalence of P. falciparum infection in Andhra Pradesh as 68.85% in 2013 and 74.60% by September 2014, while the corresponding figures for the neighboring state of Chhattisgarh were 78.80% and 84.26%, respectively³. One of the reasons attributed to the rise in proportion of P. falciparum cases is resistance to chloroquine, which was used for a long time as the first line of treatment in malaria cases⁴. So, this study was planned to determine the proportion of malaria cases in both rural and urban area of Raigarh.

Materials & Methods

Study Area- District Hospital, Raigarh
 Study Design- Retrospective study
 Study Population- Peripheral Smears of suspected Cases
 Study duration- data from January 2009 to December 2018 (10 years) was gathered.
 Sampling Technique- Purposive sampling technique
 Sample size- A total of 79218 blood smears was studied.
 Methodology- All the samples which were subjected to laboratory were included in the study.
 Consent Type- Informed consent
 Ethical Approval- Study was approved by Institutional Ethical Committee.
 Statistical Analysis- Data will be consolidated and entered a Microsoft Excel spreadsheet and then transferred to Epi info version (7.1.3.0. centre for disease control and prevention, Atlanta, Georgia, USA, 2013) software for analysis. The prevalence was determined in the form of percentages (%).

RESULT

Table 1: Year wise Prevalence of Malaria in the study area

Year	Collection	Positive	Prevalence (%)
2009	13747	663	4.82
2010	11616	763	6.57
2011	8573	334	3.90
2012	6860	232	3.38
2013	7326	189	2.58
2014	8706	244	2.80
2015	8237	249	3.02
2016	4877	85	1.74
2017	4243	89	2.10
2018	5033	63	1.25

As per table 1 total of 79218 blood smears prepared in 10 years (Jan 2009 – Dec2018) from that 2911 smear were positive which indicates around 3.67% cases were positive. As seen the Prevalence rate is falling with increasing years which indicates the level of treatment (fig 1), in

2009 it is 4.82% and 2018 it is 1.2

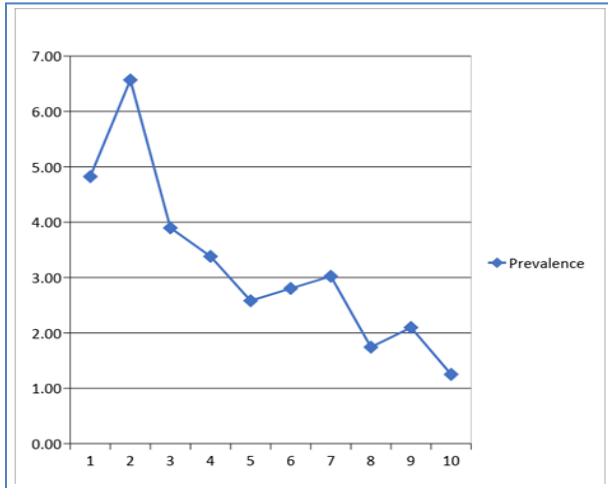


Figure 1 shows the Prevalence of Malaria

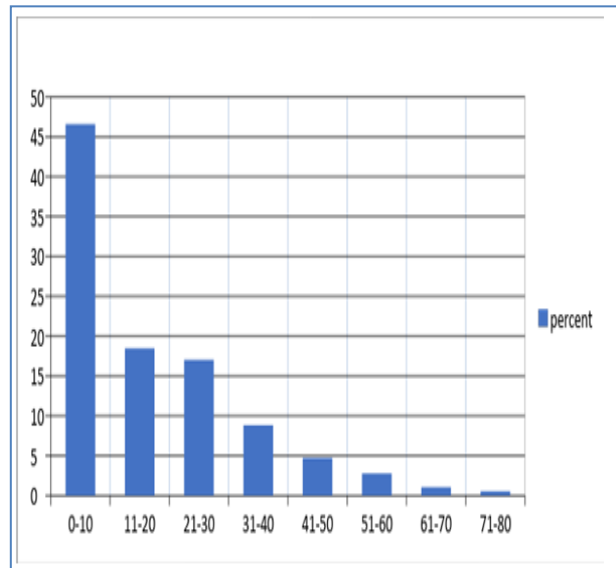


Figure 2: Age wise distribution of cases of Malaria

Table 2: Age wise distribution of cases

Year	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80
2009	303	149	101	59	23	18	5	5
2010	335	162	132	67	30	25	8	4
2011	146	53	48	38	25	12	9	3
2012	134	29	37	15	12	4	0	1
2013	109	29	30	12	4	4	0	1
2014	137	28	43	14	16	6	0	0
2015	105	34	55	28	16	5	6	0
2016	34	15	15	12	5	1	2	1
2017	35	24	19	5	1	4	0	1
2018	18	14	15	7	6	2	1	0
Total case	1356	537	495	257	138	81	31	16
percentage	46.58	18.45	17.00	8.83	4.74	2.78	1.06	0.55

As per Figure 2 and Table 2 Cases includes all age groups and were classified into various age group, positive cases were found to be highest under 10 years (46.58%) and minimum in (71-80yr) is 0.55%. which is in decreasing trends with increasing age.

Table 3: Sex wise Comparison Malaria cases in terms of prevalence.

Year	Positive	Male	Male Prevalence (%)	Female	Female Prevalence (%)
2009	663	342	51.58	321	48.42
2010	763	398	52.16	365	47.84
2011	334	168	50.30	166	49.70
2012	232	121	52.16	111	47.84
2013	189	99	52.38	90	47.62
2014	244	137	56.15	107	43.85
2015	249	126	50.60	123	49.40
2016	85	50	58.82	35	41.18
2017	89	51	57.30	38	42.70
2018	63	41	65.08	22	34.92
Total case and percentage.	2911	1533	52.66	1378	47.34

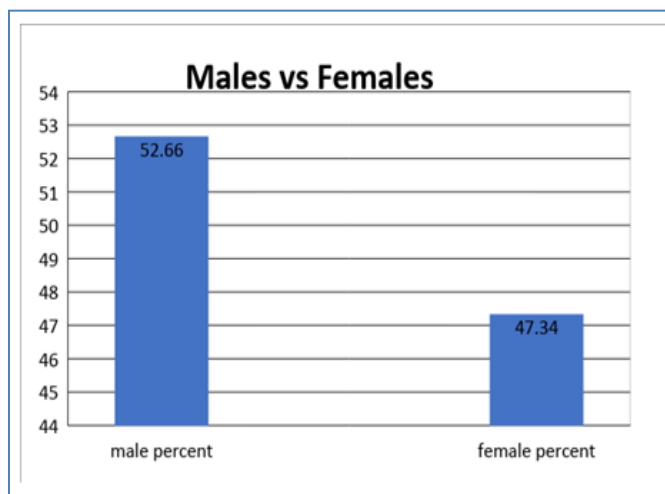


Figure 3: Sex wise comparison of cases

As per table 3 the study is male preponderance as the males comprises (53%) of malaria cases while female only 47%.

Table 4: Comparison of cases in terms of Plasmodium Vivax and Plasmodium Falciparum

Year	Positive	PV	PV prevalence	PF	PF prevalence
2009	663	197	29.71	466	70.29
2010	763	161	21.10	602	78.90
2011	334	71	21.26	263	78.74
2012	232	57	24.57	175	75.43
2013	189	29	15.34	160	84.66
2014	244	48	19.67	196	80.33
2015	249	53	21.29	196	78.71
2016	85	31	36.47	54	63.53
2017	89	26	29.21	63	70.79
2018	63	17	26.98	46	73.02
Total	2911	690	23.70	2221	76.30

As per table 4 we further classified according to species and we found only two species were plasmodium falciparum and plasmodium vivax. Majority includes falciparum cases (76.3%) in comparison to vivax (23.70%) it is three fourth of all positive cases. Trend is maintained in every year.

Discussion and Conclusion-

The epidemiology of malaria is the product of complex interaction between host vector and parasite factor that are specific to each location in which malaria occurs.⁵ Malaria in central India (Chhattisgarh) is complex because of the vast tracts of forest with tribal settlement. Furthermore, socioeconomic status, cultural characteristic, health care infrastructure, and degree of mobility of population also differ between locations and populations, and contribute to the diversity of malaria characteristics in the region. In our study we found decreasing trends of malaria over passing years. Cause for this may be due to malaria control programme in India like national malaria control programme (NMCP) 1953, national malaria eradication programme (NMEP) 1958, multipurpose worker scheme (MPW scheme) 1979 and implementation of malaria action plan 1995 (MAP-95). All these plans were very effective that change our goal from control to eradication. On the other hand, factors related to the human population could also be relevant, such as levels of acquired immunity and levels of self-protection including self-medication and awareness. In our study we found that prevalence is more in paediatric age group and highest approximately half cases were under 10yr age group, severe malaria most commonly occurs in young children.⁶ Where malaria transmission is low or unstable (sporadic or periodic) as has been described in southeast Asia, natural immunity is slow to develop, all age groups are affected.^{7,8} In this study we found that positive cases were more prevalent in male than female, possibly due to male person were out of home for service, Raigarh is industrial area where continuous construction work in progress

and lot of garbage surrounding that area, as well as nearby forest area and rural agricultural fields where mainly male workers are doing work. In our study we found that burden of falciparum cases are more than vivax. Which is like the World Malaria Report 2014.⁴ In 2013, 0.88 million cases have been recorded, with 128 million tests being conducted on the suspected cases, with *P. falciparum* causing 53% and *P. vivax* causing 47% of the infections. One study conducted in Bilaspur Chhattisgarh in 2006, they also found more prevalence of falciparum that is 76.1%.⁹ in the proportion of p. falciparum infection over p.vivax may be because of prevailing chloroquine resistance against p. falciparum which is existing in the area since 1980.¹⁰

Since unbridled urbanization, drought, migration of worker and lack of awareness about preventive measures are all contributing to resurgence of malaria in India and outbreaks are frequently recorded. C.G. is rural agricultural state marked by severe poverty and underdevelopment. So, it is logistically very difficult to control malaria in India and the problem is expected to exacerbate in the coming years. It is also important that the community needs to be involved through inclusion of grass root health workers such as Accredited social health activists (ASHAs) and community health workers⁹. Health education through IEC (Information, Education and Communication) activities and behavioural change communication (BCC) are also very important intervention measures aimed at improvement of environmental sanitation and personal protection from mosquito bites for the elimination of malaria in the endemic areas as well as in the whole country.

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