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Survey of types of malaria found in Bihar with serodiagnostic test analysis

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Abstract: Malaria is a parasitic disease caused by a protozoan of the genus *Plasmodium*. Despite the fact that it is a preventable disease, it ranks among the major health challenges for developing countries including India. This paper is based on a survey conducted for the analysis of condition of malaria during 2015- 2019 in Madhepura region of Bihar. During this survey it is found that malaria is a major cause of death in different regions of Bihar. Effective ways to manage malaria now exists but then also the number of malaria cases is still increasing, due to multiple factors. Proper diagnostic methods are essential for the management and control of malaria. In rural areas traditional methods for diagnosing malaria remain problematic; therefore, new technologies have been developed and introduced to overcome the limitations. This paper deals with the serodiagnostic test analysis for malaria.

Key words: *Plasmodium*, malaria, diagnosis, method, serodiagnostic test

INTRODUCTION

India is a developing nation which accounts for about 6% of the worlds malaria cases. It has a death rate of, 1.97 per 1,00,000 individuals. A great geo-ecological diversity, large population and a variety of distribution agents or vectors, makes malaria a complicated problem in India. Malaria is caused by protozoan parasite *Plasmodium* and its four different species namely *falciparum*, *malariae*, *ovale* and *vivax* are responsible for malaria in humans. It is transmitted by female anopheles mosquito. The disease has an incubation period of about seven days.

Symptoms include fever, chills, headache, vomiting, severity of the disease may cause coma, followed by death. Malaria caused by *Plasmodium falciparum* is prevalent in Madhepura region, accounting for approximately 65% of

the total infections. *P. vivax* is ranked second in infections, accounting for 15-20% of the total infections. There are about 9 species of anopheles which act as vectors. Mosquitogenic conditions like stagnant water leads to increased potential of malaria transmission.

The life cycle of malarial parasite comprises of schizogony, an asexual phase occurring in humans and sporogony, a sexual phase occurring in mosquito. The cycle is completed in 7-15 days. Presence of foetal haemoglobin is found to be unfavourable for *P.falciparum* development. Maternal immunity, and low exposure play a vital role in infants defense against malaria.

Co-existence of different malarial species in the same human host is very common in areas where one species is endemic. Bihar has always dominated the disease map. 7 out of 38 districts in Bihar is endemic for malaria. The risk of acquiring this disease during monsoon is very high.

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Respective authorities have ensured to keep the antimalarial drugs amount sufficient and prevent any kind of breeding ground due to water logging or drainage failure.

MATERIALS AND METHODS

Taking patients' statistics conservatively equal to the annual number of serological tests done in Bihar. A cross-sectional survey was conducted randomly in ten regions of Madhepura, Bihar. 4023 people were approached for the survey purpose and 963 families were also approached

for a mosquito net-owing survey. Some hospitals were also surveyed about their medical facilities regarding the test of malaria. The data were analyzed and illustrative statics were used. Firstly the areas were divided into three categories viz. high, middle and low malarial cases based on the government data provided by health department. Everyone in the survey area was invited to take part in the survey but only 4023 people were interested in this survey.

During the survey various questionnaire regarding the treatments, diagnostic, report and precautions were developed. The details of report were as follows:-

Table 1- Data collected from the ten sites of Madhepura, Bihar

Sl.no.	Sites	No. of samples	Positive	%
1	S1	512	136	26.56
2	S2	421	102	24.22
3	S3	369	135	36.58
4	S4	412	165	40.04
5	S5	561	101	18.00
6	S6	357	98	27.45
7	S7	322	80	24.84
8	S8	385	79	20.51
9	S9	328	56	17.07
10	S10	356	69	19.38
Total		4023	1021	25.37

Table 2- Data from the health ministry department was collected for last 5 years.

Year	Number of malaria cases
2015	2043
2016	4020
2017	5205
2018	4006
2019	1085

After seeing these numbers, which seem to be fluctuating every year, we can say that environmental factors play a major role in spreading this disease. The year 2020 seems even more prone to malaria as monsoons seem to start much earlier. The humidity is high forming a favourable environment for their breeding.

CONCLUSION

To enable transmission the climate must be favourable for long enough for malarial parasite to persist. The extent of transmission depends upon the density and pathogenecity of the vector. In places where density of humans is high or there is lack of appropriate sanitation

the occurrence of malaria is high. The female anopheleses are usually active during dusk or dawn, a time when most people love to stay outdoors.

To prevent from malaria many methods have been listed by health officials as well as the government of India has developed various schemes to counteract the spread of this disease.

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