ORIGINAL RESEARCH

Prevalence of malarial groups and recurrent patterns in tertiary care hospital

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ABSTRACT

Introduction: Malaria is a significant public health issue in the country. It is an infection caused by parasites of the genus Plasmodium, which are transferred to humans by particular kinds of female mosquitoes infected with the disease. The study aimed to determine the prevalence of various groups of malaria and their intermittent patterns in a tertiary care hospital. **Materials and Methods:** We employed microscopic examination to diagnose malaria by creating thick and thin smears and staining them with field stain. In microscopy, we have analysed for the presence of the malaria parasite, identified the species, and observed the many types of malarial parasites. **Results:** The incidence of malaria in our region is 1.9%. Out of 102 samples that were examined under a microscope, the prevalence of P. vivaxis was found to be 65%, P. falciparum was found to be 34%, and there were no cases of mixed infections involving both P. vivax and P. falciparum. **Conclusion:** A high number of cases were documented between September and October, indicating that malaria is most prevalent during the rainy season. After that, there was a significant decrease in the rates of both P. vivax and P. falciparum. **Keywords:** Pervasiveness, intermittent trends, P. vivaxand P. falciparum, Maleria

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INTRODUCTION

Malaria is a result of Plasmodium parasites. It is transmitted to humans by the bites of Anopheles mosquitoes, which are recognised as carriers of malaria. There are primarily four species that result in human infection, namely Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, and Plasmodium ovale. Plasmodium falciparum and Plasmodium vivax are commonly found in India. Malaria is a significant public health issue in the country. It is an infection caused by parasites of the genus Plasmodium, which are transferred to humans by particular kinds of female mosquitoes that are infected.¹Based on the World Malaria Report 2012, around 3.3 billion individuals were at risk of malaria worldwide in 2011. The sub-Saharan African population faced the greatest risk, with approximately 80% of cases and 90% of deaths occurring in the WHO African Region. Among those affected, children under five years old and pregnant women experienced the most severe consequences.² Based on the official data from NVBDCP, approximately 95% of the population in the country lives in places where malaria is prevalent. Additionally, 80% of the recorded malaria cases in the country are limited to

areas where just 20% of the population dwells. These areas are typically tribal, hilly, difficult to access, and inaccessible. It is understood that climatic conditions such as temperature and rainfall greatly affect the spread of diseases carried by mosquitoes and the number of vectors present. If a connection is established between temperature and rainfall and the abundance of mosquitoes and the incidence of malaria in an area, it might potentially be used as a predictor for anticipating the spread of the disease. There are two kinds of parasites that cause human malaria, Plasmodium vivax (Pv) and P. falciparum (Pf), which are frequently found in India.³ The six main vectors of malaria in India are An. culicifacies, An. stephensi, An. fluviatilis, An. mimimus, An. dirus, and An. epiroticus.⁴ Against this backdrop, an effort has been made to conduct a three-year retrospective analysis of malaria cases admitted to the Dr. Bidhan Chandra Roy Hospital, Haldia, West Bengal.

While India is recognized as one of the countries where malaria is prevalent, the occurrence of the disease is often affected by environmental factors such as climate, season, temperature, and socioeconomic position.⁶ Moreover, currently it is a concern in both rural and urban regions, hence this

study intends to conduct prevalence monitoring in a hospital in West Bengal. The study aimed to determine the prevalence of various types of malaria and their intermittent patterns in a tertiary care hospital.

METHODS

A total of 5320 patients were assessed. All patients who reported having a fever were included in the study. Patients who presented with fever as their main complaint, whether they had visited the outpatient department or were admitted to the ward, underwent initial assessment and had their blood samples obtained by the central laboratory. This study aims to examine the bed head tickets of patients admitted to the medicine department from March 1, 2019, to July, 2020. The sample technique used a complete enumeration sampling, meaning that all bed tickets filed in the central record room were included and available for retrieval. These bed tickets were relevant to the reference period of the study. All death records throughout the specified time frame were examined.We employed Microscopic inspection to diagnose malaria by creating thick and thin smears and staining them with field stain. During microscopy, we have analysed samples to detect the presence of malaria parasites, identify the species, and observe the various forms of these parasites.

RESULTS

We gathered a total of 5320 samples, out of which 102 samples were judged to be microscopically positive. At our hospital, we only encounter Plasmodium vivax and Plasmodium falciparum species. Table 1 displays the monthly distribution of malaria infection in our hospital. The overall occurrence of malaria in our region is 1.9%. Out of 102 samples that were examined under a microscope, the prevalence of P. vivaxis was found to be 65%, P. falciparum was found to be 34%, and there were no cases of mixed infections that included both P. vivax and P. falciparum.

Table 1: Month wise trend of malaria cases.

Month	Total samples	Total positive
June	345	8
July	525	6
August	759	12
September	1158	28
October	1163	36
November	712	10
December	658	2



Table 2: Prevalence of different type of plasmodium infection.

P. vivax(%)	P. falciparum (%)	Mixed Infection
6 (75%)	2 (25)%	0
5 (83%)	1 (16%)	0
9 (75%)	3 (25%)	0
20 (71.42%)	8 (28.57%)	0
20 (55.55%)	16 (44.44%)	0
6 (60%)	4 (40%)	0
1 (50%)	1 (50%)	0

DISCUSSION

The occurrence of malaria in our region is 1.9%. The prevalence of P. vivaxis is 65% and P. falciparum is 34% among the 102 microscopically positive samples. The prevalence of mixed infections, which include both P. vivax and P. falciparum, is 0.00%. Comparable results about the greatest rate of P. vivax infection were obtained in the current investigation. Additional examination of the monthly distribution of cases reveals that instances of malaria begin to rise in June each year and remain relatively high until October. After that, they progressively decline. Similar results were also reported by a study conducted by Hadiya T. et al, where 61.41% of patients were positive for Plasmodium vivax and 38.56% were positive for Plasmodium falciparum. The seasonal trends seen in their study were comparable to ours. The distribution of cases in the present study was compared with the study conducted by Prajapati et al.^{5.6}The rate of deaths in proportion to the total number of cases has consistently decreased over time in malaria cases. The proportion of deaths attributed to malaria was 8.97% during a period of three years. The percentages were 9.28% in 2010, 8.90% in 2011, and 8.79% in 2012. The rate of deaths relative to the total number of cases has consistently decreased over time in malaria cases.O. Ayoola and colleagues at University College Hospital in Ibadan demonstrated that malaria accounts for 6.2% (73 out of 1185 fatalities) of the overall mortality in that hospital.⁷ In Papua, Indonesia, EmilianTjitra et al discovered that a total of 242 patients with malaria died, representing 15% (242/1,608) of all inpatient deaths over the same time frame.⁸A study conducted by Muddaiah M, et al showed that the infection rate of Plasmodium vivax was the greatest at 52.54%, followed by Plasmodium falciparum at 33.75%, and the incidence of mixed malarial infection was 13.69%.9 A study conducted by Ali Bin Zubairi S, et al. in Pakistan revealed that P. vivax and P. falciparum were responsible for 83% and 13% of the cases, respectively.¹⁰Ceesay et al at a hospital in Gambia discovered a significant reduction in the annual number of hospital admissions and fatalities caused by malaria.11In 2007, the hospital had a 74% decrease in the frequency of malaria cases compared to 2003. In Mehsana district of northern Gujarat, B.

Prajapati et colleagues discovered that there was a progressive decline in malaria cases between 1999 and 2004.6Both these finding are contrast to findings of this investigation.

CONCLUSION

The highest point of the number of cases occurs from June onwards, and the increase in the number of cases continues until October. After that, it gradually decreases with a slight increase in late November and December. A large number of cases were documented between September and October, indicating that malaria is most prevalent during the rainy season. After that, there was a significant decrease in the rates of both P. vivax and P. falciparum.

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