

A retrospective review on Malaria and Antimalarial drugs in Tripura, India – A Survey Report

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Abstract

This study reveals the status of disease malaria in Indian hilly areas with respect to availability of drugs and to identify the common causative parasites of malaria. The work was carried out in urban and rural areas of Tripura. In both cases 500 indoor patients' bed tickets were surveyed to find out the causative parasite, recovery period, antimalarial drug used and again to compare the facilities, diagnostic procedure and clinical status. In this study it was observed that the clinical pharmacy strategies were not well maintained in hospitals of both the areas but the disease was well handled in semi rural areas. The self medication, magic remedies /mantras are still in practice among rural peoples. In this survey it was observed that; in primary cases of malaria, patient recovered within 5-7 days; whereas in severe cases it took 25-30 days, if proper medication is provided. But 25% of patients come to hospital only when disease is in chronic situation. In both the places two types of parasites were mainly found - Plasmodium falciparum & Plasmodium vivax. In acute cases of malaria, chloroquine group of drugs were widely prescribed and in normal cases the proguanil group was the choice of drug by the physicians.

Key words: Malaria, Anti-malarial drugs, Malaria parasite, Plasmodium

INTRODUCTION

Malaria is one of the most common infectious diseases and an enormous public health problem. Malaria has infected humans for over 50,000 years, and has been a human pathogen for the entire history of the species¹. Each year, there are approximately 350–500 million cases of malaria², killing between one and three million people, the majority of whom are young children in Sub-Saharan Africa³. There are sixty three species of mosquitoes still today reported worldwide. Among them, four species are very active in India, namely, *Plasmodium falciparum* (pf), *Plasmodium vivax* (pv), *Plasmodium ovale* (po) and *Plasmodium culex* (pc). The parasites multiply within red blood cells, causing symptoms that include anemia (light-headedness, shortness of breath, tachycardia, etc.), as well as other general symptoms such as fever, chills, nausea, flu-like illness, and, in severe cases, coma, and death. Malaria transmission can be reduced by preventing mosquito bites with mosquito nets and insect repellents, or by mosquito control measures such as spraying insecticides inside houses and draining standing water where mosquitoes lay their eggs⁴.

Ninety percent of malaria-related deaths occur in Sub-Saharan Africa. Malaria is commonly associated with poverty, but is also a cause of poverty⁵. As per WHO latest estimation, there are 300-500 million cases globally and 1.5- 2.7 million deaths occur due to malaria each year, 90% of which are in Africa. In India, The National Malaria Eradication Programme (NMEP) was started in 1958 and achieved near complete disappearance of disease in 1960s⁶. In 1995, NMEP has reported 2.3 million proven cases out of which 0.8 million were by *Plasmodium falciparum* and there were 1012 deaths. However, the actual incidence of malaria in India is estimated to be between 15-35 million cases per year⁷.

For diagnosis of malarial parasites, direct microscopy of peripheral smear is widely used. Other processes involved dip stick/ Quantitative Buffy coat technique (QBC). To study the epidemiological distribution of *falciparum* with its positive rate, Hbgm% label is used as a parameter⁸. Based on direct microscopy of peripheral blood smear, 7,490 patients having history of fever were registered in outpatient department of Agartala Government Medical college hospital (G. B. Pant hospital) during March 2003 - 2005. Blood was collected aseptically in EDTA vial, smear was prepared of all 7,490 registered cases and leishman stain was done.

Hemoglobin estimations were done by acid hematin method for all 36 positive cases in the department of clinical microbiology. Out of 7,490 smears 36 were positive. Among the 36 positive patients, males were more than females with 66.66% and 33.33% respectively. Smear showed *Plasmodium falciparum* positive rate in 86.11%, others *vivax* in 8.33% and gametocyte in 5.55%. Hemoglobin pattern was markedly decreased below 8% in 66.66% and below 10% and above 8% in 36.11% cases only. Mostly were treated at home and detailed drug history was not known⁹.

In Tripura *Anopheles dirus* & *minimus*, *Culex* species were also seen. In order to improve detection of hemoparasites, QBC Assay was introduced in Tripura in private laboratory since July, 2000. During these 5 year period, total no of 6449 blood samples were examined by QBC Assay. Samples were received from patients with pyrexia of acute onset as well as PUO patients. QBC capillaries processed as per standard protocol. Giemsa stain was done in thin smear for confirmation of species. Out of 6449 samples, 1349 (21%) were positive for malaria. Among them, 1072 (79%) *P.falciparum* 197 (15%) *P.vivax*, 80 (6%) mixed infection. Surprisingly, in 4 patients Microfilaria was detected where clinical suspicion was for malaria though not in indigenous people. This was first time in Tripura Microfilaria could be detected from day time samples because of using sensitive diagnostic tool. Incidence of malaria in Tripura is quite high, *P.falciparum* is the predominant species^{9,10}.

A number of anti malarial drugs are prescribed by the doctors globally, like Chloroquine, Quinine and mefloquine, Primaquine, Antifols and Quinghaosu (Artemisinin)

MATERIALS AND METHODS

Study site

The study was conducted in five different hospitals, situated in three different locations, one is Agartala Govt, Medical College and G.B.P. Hospital, Indira Gandhi Memorial Hospital, B.R. Ambedkar Teaching Hospital, Agartala; Tripura Sundari Hospital, Udaipur; Santir Bazar Public Health Center, Santir Bazar, South Tripura were selected.

Study Period

The study was carried out for the period of three months from November 2005 to January 2006.

Study Design

Retrospective- Observational study.

Selection of Prescriptions (Bed Tickets)

Total 500 nos. of bed tickets of both male medical ward 1 and 2, female medical ward 1 and 2 were studied.

Approval of Study

The approval of the study was forwarded to the hospitals by the Head of the Institution and procured on 18.11.2005 as per NO. F. 11(33)-RIPSAT/DEG/2003-2004/5225-27.

Materials included in the study

All the bed tickets were thoroughly checked and the following information was documented. Patients name, age, sex, BP and pulse, date of admission, date of discharge, symptoms, primary medication, diagnosis, post medication, duration of treatment and treatment result. In diagnosis, the blood testing methods (smear test/QBC technique), were also documented with its identified malarial parasite.

Planning and Procedure followed for the study

The study was planned in such a way that, for each City hospital, three weeks and for each rural hospital one and half week scheduled. All the prescriptions were fragmented into two groups according to the gender. Further among those prescriptions selection was made based on how many of them were malarial parasite positive and if positive, then what type of malaria parasite it was. The first line and follow up medication provided by the doctors were recorded systematically. The drugs prescribed were categorized according to their generic class. Finally, the ratio of mortality due to malaria was calculated.

RESULTS AND DISCUSSIONS

During the study period 500 nos. of bed tickets of fever reported prescription were observed and among them 328 nos. (65.6%) had positive parasitic test. There were 237 (72.25%) male patient and 91(27.74%) female patients admitted. Out of 328(Fig.1), 271 (82.62%) were *Plasmodium falciparum*, 37 (11.28%) were *Plasmodium vivax*, 13 (6.09%) were *Plasmodium culex* positive cases (Fig.2). Among the 328 patients, 191 (58.47%) were from urban hospitals and 137 (41.53%) were from rural hospitals. In case of medication, a generalized rule was followed, whenever a patient (adult) was admitted with fever, Quinine di HCl with 5% Dextrose I.V. was administered at every 8 hrs. Paracetamol was given orally twice daily. In management of positive malarial patients, orally, first line medication, Primaquines were preferred mostly with sulfadoxines or quinines as a follow up medication (62%) and in case of I.V. medication, α , β -Arteether or β - Arteether were drug of choice as a first line dosing, followed by quinine or chloroquine

phosphate injection (31%). For critical cases, Artesunate injection was given intramuscularly (7%). About five categories of anti malarial drugs were available in the

local market and the same were prescribed, Chloroquine (35%), Antifols (26%), Primaquine (17%), Quinine and mefloquine (13%) and Quinghaosu (9%).

Fig.1: Frequency of Malaria attack according to gender

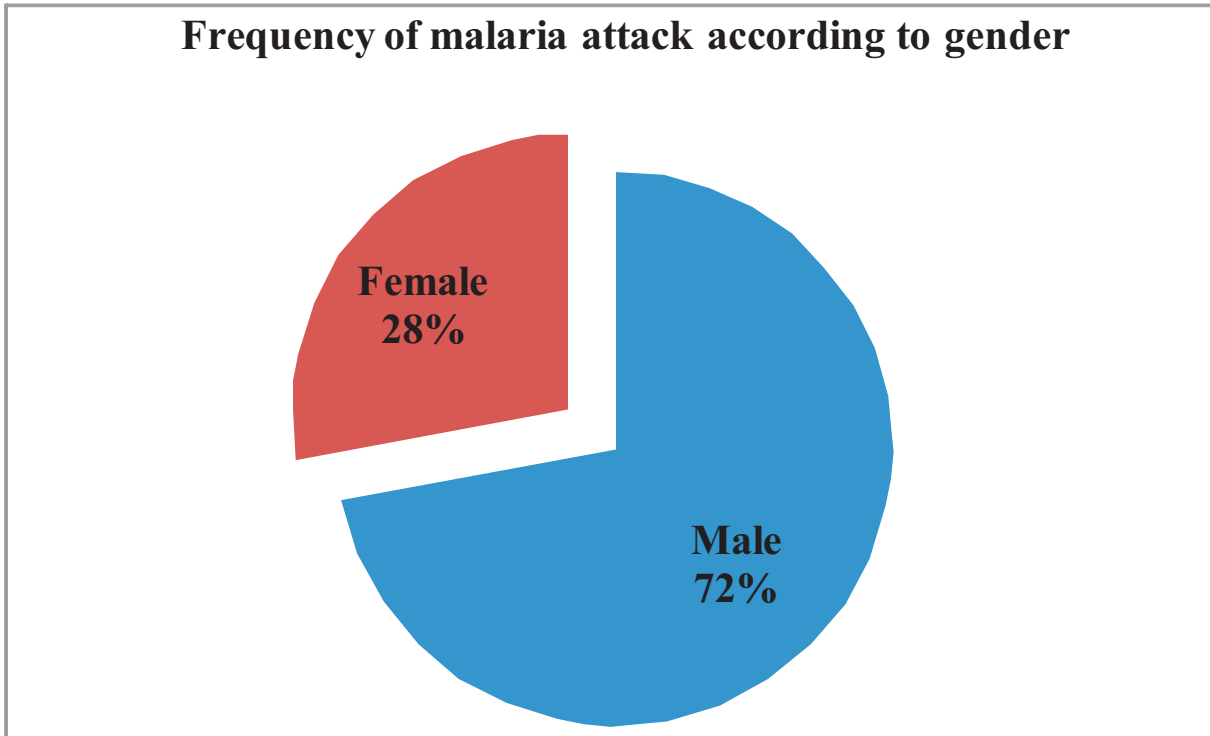


Fig.2: Percentage frequency of prescribed antimalarial drugs

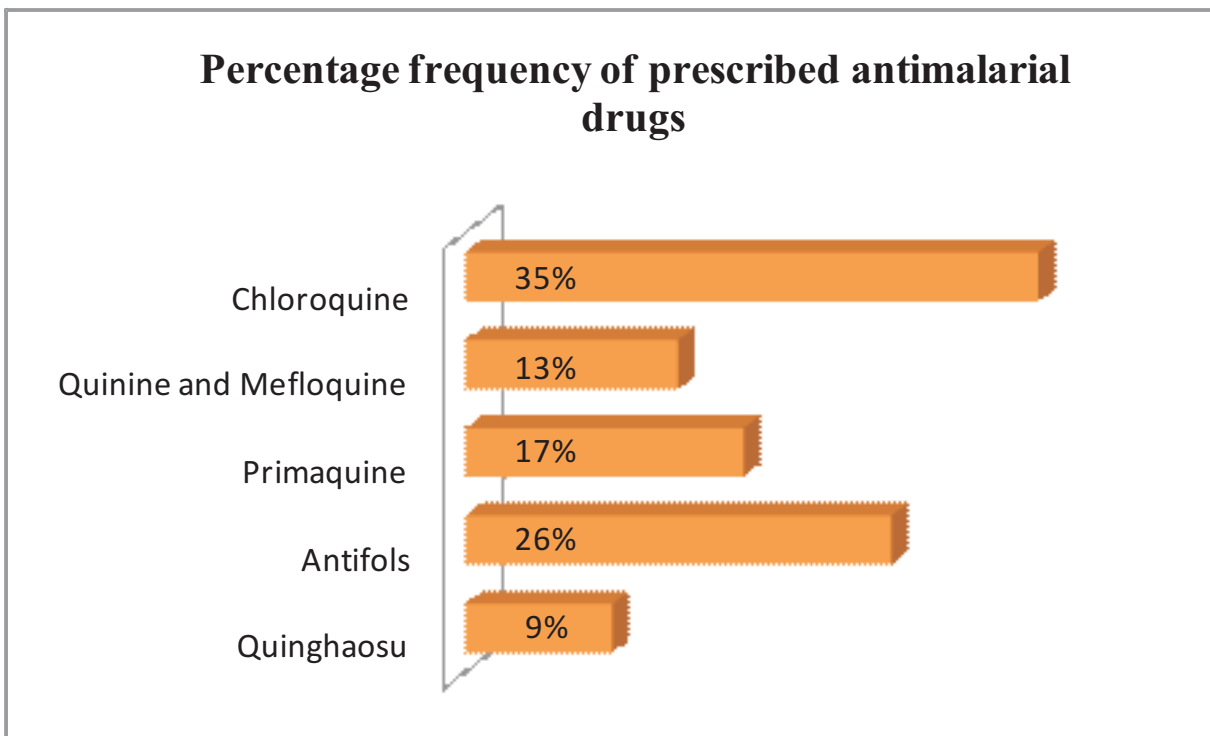


Fig.3: Ratio of Malarial Parasites found in bed tickets

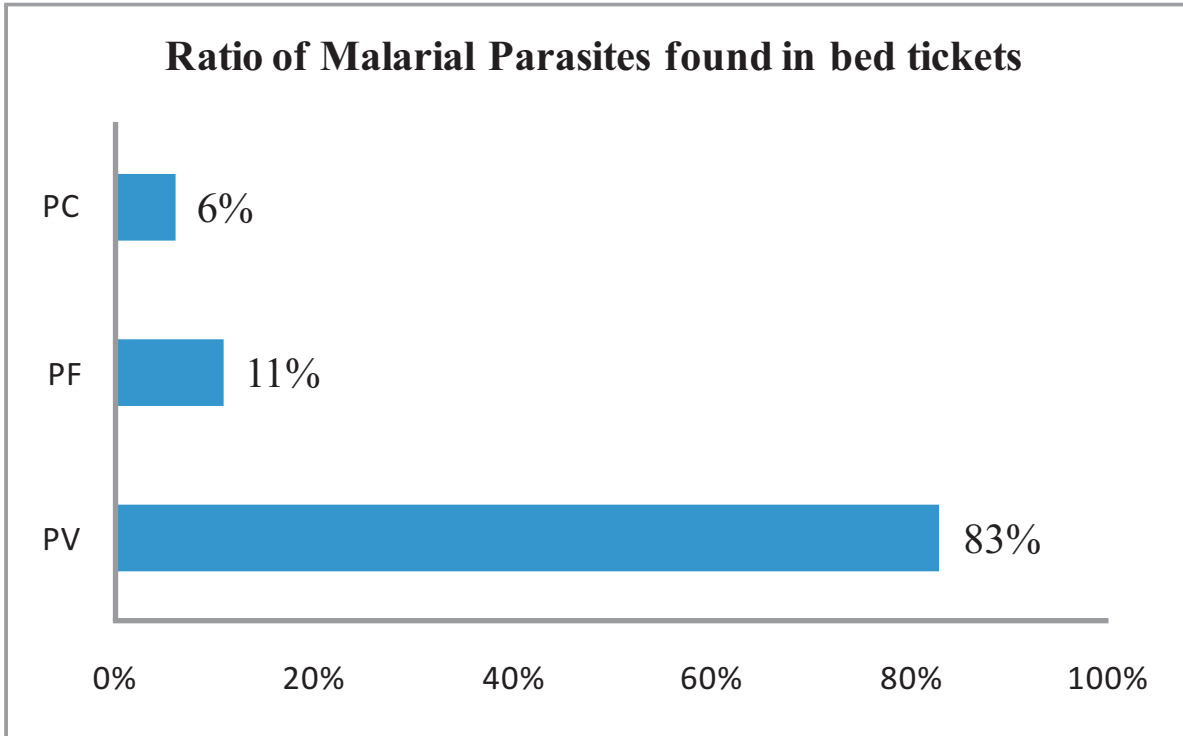


Fig.4: Choice of dosage form as per bed tickets

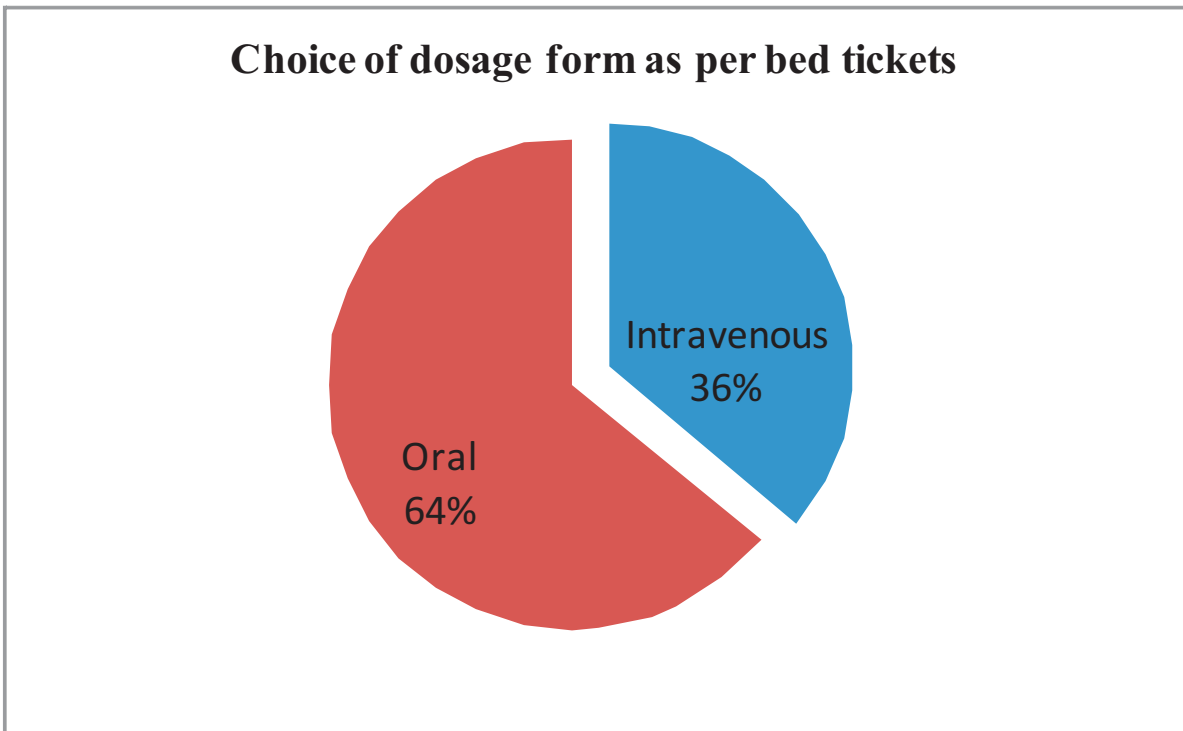


Fig.5: Ratio of Malaria attack on urban and rural area

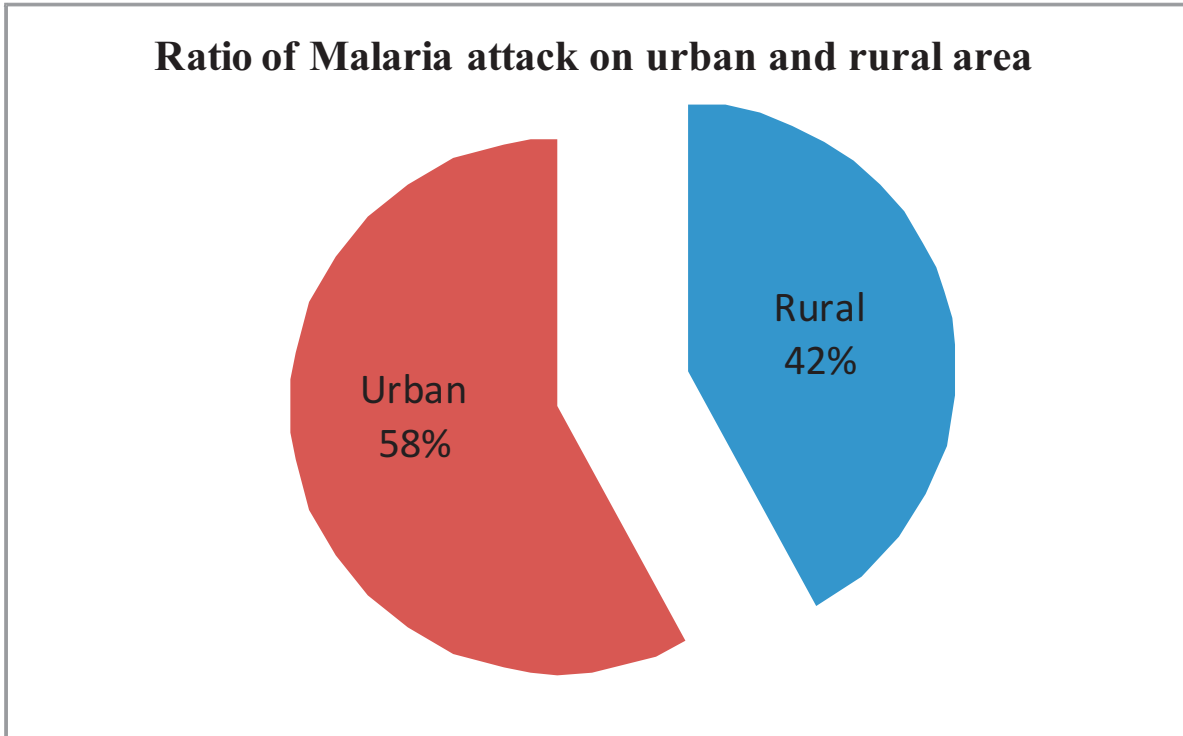
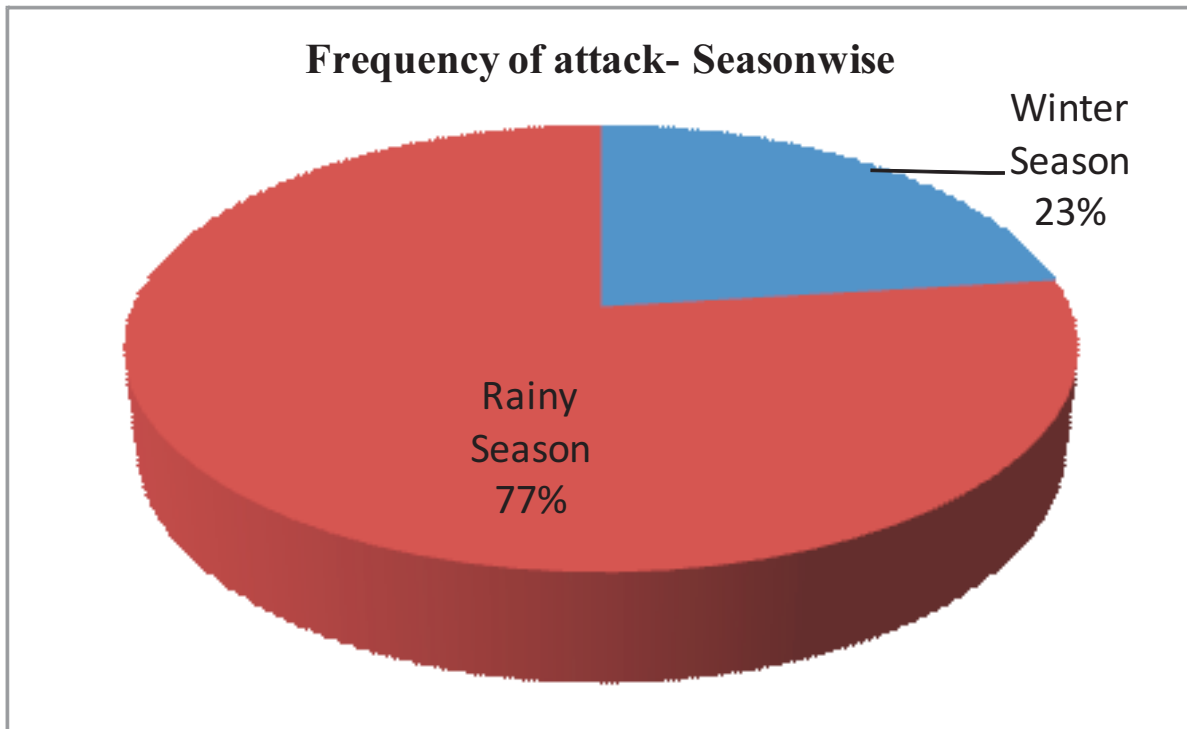


Fig.6: Frequency of attack-Seasonwise



CONCLUSION

From the above study, it was concluded that the frequency of malarial attack by species *Plasmodium falciparum* was maximum. The frequency of malaria attack is much more in urban area due to stack water of the drains and also a huge number of malarial patients were admitted to the hospitals during the rainy season. The doctors prescribed the medications for malaria depending on various factors like types of malaria parasites, severity of parasite attack, patient age and most obviously they look the economical soundness of the patients. Drugs were given mainly through oral route rather the intravenous. Beside all these things, a bi-month health camp was organized by the health department in the rural areas to create the awareness among the rural population about the disease and how they can safeguard themselves.

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