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Assessment of clinical profile of malarial fever in children's admitted to NMCH

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Abstract
Malaria is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a group of single-celled microorganisms) belonging to the Plasmodium type. The parasites travel to the liver where they mature and reproduce. Five species of Plasmodium can infect and be spread by humans. Most deaths are caused by P. falciparum because P. vivax, P. ovale, and P. malariae generally cause a milder form of malaria.
The study has planned in Nalanda Medical College and Hospital. The 30 patients detected with malaria were enrolled in to the study. The patients showing positive malarial signs in pathological diagnosis without any other complications were enrolled into the study.
Malaria continues to be common cause of morbidity and mortality in children. Globally 60% of clinical malarial cases and 80% of deaths occur in young children. Patients of vivax malaria should be monitored for the development of different complications as their early detection and treatment could be lifesaving. Further studies are needed to find out the reason behind this changing virulence.

Keywords: malaria, haematological changes, plasmodium falciparum, plasmodium vivax etc.

1. Introduction
Malaria is a mosquito-borne infectious disease of humans and other animals caused by parasitic protozoans (a group of single-celled microorganisms) belonging to the Plasmodium type [1]. Malaria causes symptoms that typically include fever, fatigue, vomiting, and headaches. In severe cases it can cause yellow skin, seizures, coma, or death [2]. Symptoms usually begin ten to fifteen days after being bitten. If not properly treated, people may have recurrences of the disease months later [1]. In those who have recently survived an infection, reinfection usually causes milder symptoms. This partial resistance disappears over months to years if the person has no continuing exposure to malaria [2].

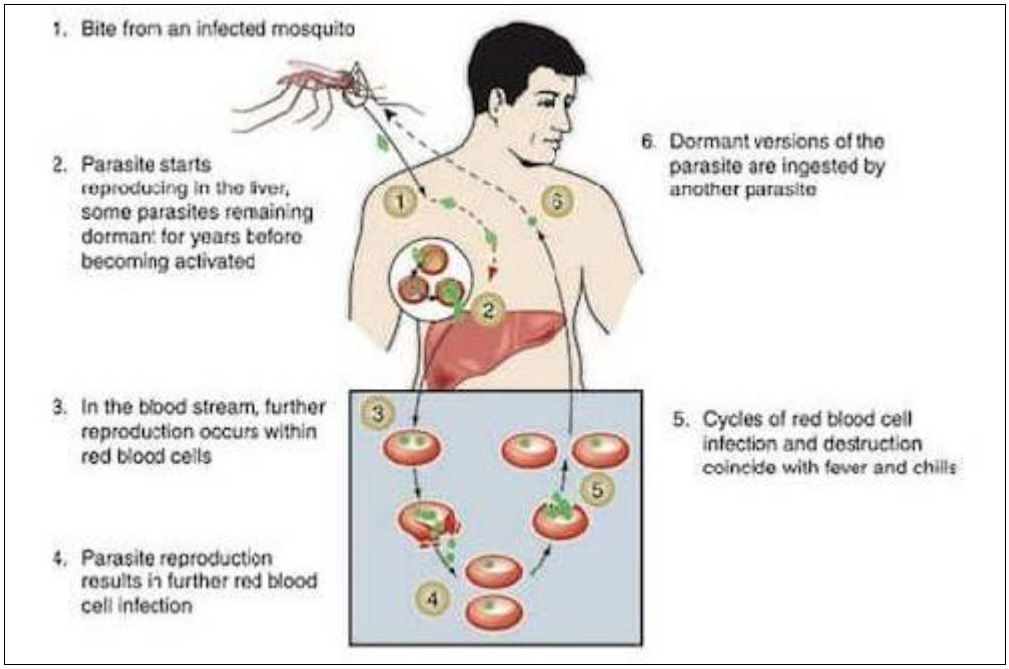

Fig 1: Process of Malarial Infection

The disease is most commonly transmitted by an infected female Anopheles mosquito. The mosquito bite introduces the

parasites from the mosquito's saliva into a person's blood [1]. The parasites travel to the liver where they mature and reproduce. Five species of Plasmodium can infect and be spread by humans [2]. Most deaths are caused by P. falciparum because P. vivax, P. ovale, and P. malariae generally cause a milder form of malaria [1, 2]. The species P. knowlesi rarely causes disease in humans [1]. Malaria is typically diagnosed by the microscopic examination of blood using blood films, or with antigen-based rapid diagnostic tests [2]. Methods that use the polymerase chain reaction to detect the parasite's DNA have been developed, but are not widely used in areas where malaria is common due to their cost and complexity [3].

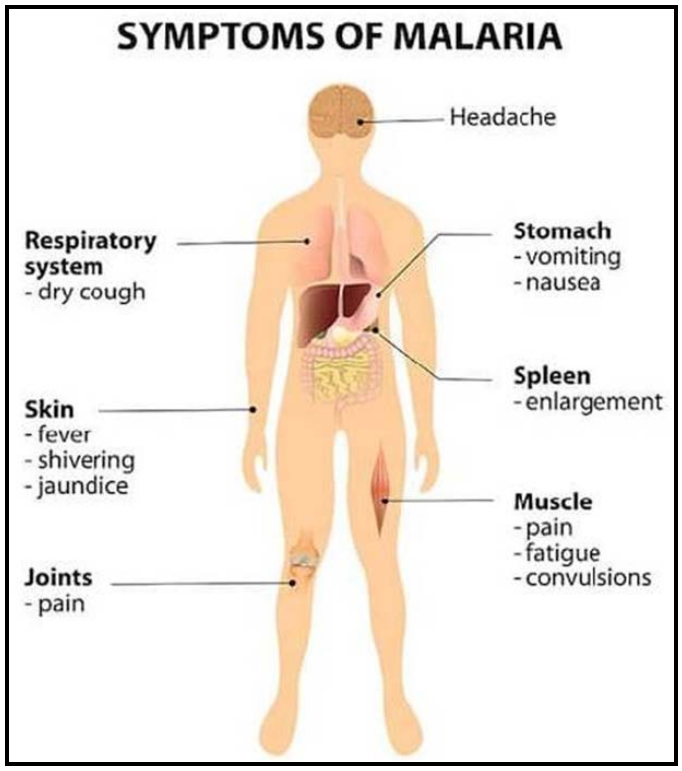

Fig 2: Symptoms of Malaria

According to the World Malaria Report 2014, 22% (275.5m) of India's population live in high transmission (> 1 case per 1000 population) areas, 67% (838.9m) live in low transmission (0–1 cases per 1000 population) areas and 11% (137.7m) live in malaria-free (0 cases) areas. 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. The incidence of malaria in India accounted for 58% of cases in the South East Asia Region of WHO [5]. At present, official figures for malaria in India, available at NVBDCP [6], indicate 0.7–1.6 million confirmed cases and 400-1,000 deaths annually. Haematological changes, which are the most common systemic complications, play a significant role in these serious complications. The haematological abnormalities that have been reported to consistently companion which comprise anaemia, thrombocytopenia, and atypical lymphocytosis and infrequently disseminated intravascular coagulation. Leucopenia, leucocytosis, Neutropenia, Neutrophilia, Eosinophilia and monocytosis also have been reported. In tropical countries like India, the majorities of the shared complications commencing due to malarial consequences is from hyperparasitaemia. Mortality is very high (10- 30%) in complicated P. falciparum infection.

The aim of our study was to find out the spectrum of clinical manifestations, infecting species, age distribution and mortality in admitted patients of malaria in our set up. The morbidity and occasionally mortality related with malaria is high and these haematological factors show a significant part in it.

Materials & Methodology

The study has planned in Nalanda Medical College and Hospital. The 30 patients detected with malaria were enrolled in to the study. The patients showing positive malarial signs in pathological diagnosis without any other complications were enrolled into the study.

The age group of the patients are from 1-14 years. The patients visited to Out Patient Department (OPD) and in-patient department (IPD) of Nalanda Medical College and Hospital were considered in the study. All the patients are informed consents. The entire patient's clinical history was collected.

The inclusion and exclusion criteria for the study were as follow:

Inclusion Criteria

- Children in age group of below 14 years.
- Peripheral smear or rapid malaria antigen test (RMAT) positive for Plasmodium vivax and plasmodium falciparum malaria.

Exclusion Criteria

- Patient presenting with fever (Malarial parasite negative on peripheral smear and/or RMAT negative) but treated empirically like malaria.

Results & Discussion

A total of 30 cases of probable malaria were admitted to paediatric department and all are weresero positive patients satisfied the inclusion criteria and were enrolled. The data were collected from these patients and discussed as below.

Table 1: Age distribution of malarial cases

Age group	Plasmodium falciparum	Plasmodium vivax	Mixed
1-3yrs	3	5	2
3-7yrs	5	8	2
7-14yrs	2	2	1
Total	11	15	5

Table 2: Haematological profile in the malarial patients

Haematological Parameter	Number of Cases
Haemoglobin	
Less than 5 mg	3
Between 5-10 mg	17
More than 10 mg	10
Platelet Count (per cu mm)	
Less than 50,000	5
Between 50,000-1,50,000	9
More than 1,50,000	16
Serum Bilirubin (per cu mm)	
Less than 1.2 mg/dl	18
Between 1.2-1.5 mg/dl	10
More than 5-10 mg/dl	2
SGPT	
Less than 10-40 IU/L	18
Between 1.2-1.5 IU/L	9
More than 5-10 IU/L	3
Blood Urea %	
41-100	25
101-200	5
Serum Creatinine	
1.4-3	24
3-10	4
More than 10	2

Vivax malaria has always been described as benign disease in the past. However, in recent few years many cases of severe vivax malaria has been reported and some of them have resulted in death. The present study also suggests that many of the cases of severe malaria are caused by P vivax. The exact cause of change in the presentation and complications of vivax mlaria is not known. However, various hypotheses may be change in the gene of the parasite or gradually developing resistance to commonly used drug chloroquine. Earlier it was thought that the severity of vivax malaria was actually due to coinfection with falciparum but now it is clear that vivax alone can cause life threatening complications [7]. Severity of vivax malaria is mainly because of inflammatory and immunological response [8]. Thrombocytopenia in malaria is because of immune mediated hemolysis [9]. Low platelet count has been commonly reported in vivax malaria [10].

Malaria continues to be common cause of morbidity and mortality in children. Globally 60% of clinical malarial cases and 80% of deaths occur in young children

Conclusion

Patients of vivax malaria should be monitored for the development of different complications as their early detection and treatment could be lifesaving. Further studies are needed to find out the reason behind this changing virulence. Early detection, prompt management, and adequate supportive therapy may reduce mortality due to falciparum malaria. Early and timely antimalarial treatment may improve the survival rate for probable malaria.

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