ORIGINAL RESEARCH PAPER

General Medicine

A STUDY OF CLINICAL PROFILE AND DIAGNOSTICS OF MALARIA CASES IN A TERTIARY CARE HOSPITAL OF CENTRAL INDIA

KEY WORDS: .

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ABSTRACT

Introduction: Malaria is one of the most widespread parasitic diseases all over the world. This paper attempts to diagnose malaria among clinical suspicious malarial cases, compare between peripheral smear method and rapid diagnostic test of diagnosis and study the hematological parameters in malaria positive cases.

Methodology: A comparative study on 100 malaria probable cases was carried out in MYH Hospital, Indore from the period October 2010 to September 2011. Exclusion and Inclusion criteria were used to recruit cases from the wards and OPDs of the hospital after obtaining permission from IEC, MGM Medical College, Indore. Appropriate descriptive statistics was used to analyze the data.

Results: Out of 100 patients studied 40 patients were positive for malaria. There were 25 and 15 positive cases amongst males and females respectively. There were 31 cases positive by both RDT and microscopy, 8 alone by RDT and 1 alone by microscopy. Fever and anemia was present in 100% and 57% patients respectively.

Conclusion: It is evident from the findings that the clinical profile of malaria and its laboratory findings haven't changed much. But there is a scope of further analysis of the results found in two different investigations in diagnosing malaria so that a definite conclusion may be made.

Introduction

Malaria is one of the most widespread parasitic diseases all over the world. The disease present in 102 countries is responsible for over 100 million reported cases annually and 1-2 million deaths, especially in children.(1) Normally, diagnosis of malaria is based on clinical symptoms such as presence of chills and rigors, intermittent fever, etc. which are non specific, leading to false diagnosis and over use of anti-malarial drugs, thus increasing the potential of drug resistance, as well as the number of malaria cases.

Rapid, accurate and accessible detection of malaria parasites is important in the prevention and treatment of malaria. malaria morbidity, mortality and transmission can be reduced if prompt diagnosis and adequate treatment is available. Rapid diagnostic tests (RDTs) offer the potential to provide accurate and timely diagnosis to everyone at risk, reaching those previously unable to access good quality microscopy services. In malaria –endemic regions, the use of RDTs is very helpful for the effective use of anti-malaria drugs as treatment is based on parasite diagnosis and not just fever alone. In these regions, a considerable proportion of these drugs have been wasted on patient with non-malarial disease due to lack of prompt and accurate laboratory diagnosis. (2, 3)

Parasitological confirmation of the diagnosis of malaria through microscopy is part of good clinical practice and should always be part of malaria case management. However, the following exceptions apply: (2, 4)

- Children under the age of 5 years in high prevalence areas. There is no evidence yet that the benefits of parasitological confirmation outweigh the risk of not treating false negatives.
- Cases of fever in established malaria epidemics where resources are limited.
- Where good quality microscopy is not feasible.

During the past one decade number of Rapid Diagnostic Test kits (RDTs) for malaria have been developed, evaluated and validated for improved sensitivity and specificity. These RDTs are based on the principle of immune-chromatography, require finger prick blood and detect malaria specific antigen.(3)

There is a long-standing recognition that good quality, standard Malaria microscopy is relatively expensive and difficult to deliver in many basic, primary health care settings in developing countries, while RDTs for malaria have now become widely available and affordable.(5-9)

This paper attempts to diagnose malaria among clinical suspicious malarial cases, compare between peripheral smear method and rapid diagnostic test of diagnosis and study the hematological parameters in malaria positive cases.

Materials and Methods

Type of study: Comparative, prospective study

Study area: Department of Medicine and Pathology, Mahatma Gandhi Memorial Medical college& Maharaja Yashwant Rao Hospital Indore.

Sample size:100 patient with clinical suspicion of malaria.

Study duration: One year from Oct. 2010 to September 2011.

Exclusion criteria:

1. Had been treated for malaria
2. Had symptoms suggestive of severe malaria
3. Did not have symptoms suggestive of malaria

Inclusion criteria:

1. Patients attending to M.Y.H. with self-assessed symptoms.
2. Had symptoms of uncomplicated malaria

Peripheral blood smear and rapid diagnostic test using Bioline Malaria P.f/P.vstix were performed on all the 100 patients.

From each patient 2 ml of venous blood sample were collected in Ethylene diamine tetra acetic acid bulb and standard thick and thin films were prepared on clean glass slides. thick films were prepared by placing a small drop of blood in the centre of the slides and evenly spreading it out with the corner of another slides to cover an area about 4 times its original area, air dried for 30 min, dehemoglobinised and stained with Giemsa stain.

Search was made in 100 oil immersion fields. Thin smears were prepared and stained with Leishman and Giemsa stains and search was made for malarial parasites.

A complete blood count was performed on all patients using Diatron automated hematology analyzer and following parameters were studied-hemoglobin, total WBC count, differential count, MCV, MCH, MCHC and platelet count.

By using automated hematology analyzer and peripheral blood smear examination, the hematological changes in malaria such as anemia, leucopenia, leucocytosis, monocytosis ,pigments in the WBC's, thrombocytopenia were studied.

Stained Blood Films

Microscopic examination of blood films stained with Giemsa stain. Blood obtained by pricking a finger is the ideal sample because the density of developed trophozoites or schizonts is greater in blood from this capillary-rich area. Blood obtained by venipuncture collected in heparin or (EDTA) anticoagulant-coated tubes and used shortly after being drawn to prevent alteration in the morphology of white blood cells (WBC) and malaria parasites. Both thick and thin blood films should be prepared.

Thick blood film.

The thick blood film concentrates the layers of red blood cells(RBC) on a small surface and is stained as an unfixed preparation using Giemsa stain. The thick blood film provides enhanced sensitivity of the blood film technique and is much better than the thin film for detection of low levels of parasitemia and reappearance of circulating parasites during infection recrudescence or relapse.

Thin blood film.

The thin blood film is methanol fixed and stained with diluted Giemsa using buffered water at pH 7.2 to emphasize the parasite inclusions in the RBC. Because of the fixed monolayer of RBC available in this procedure, the morphological identification of the parasite to the species level is much easier and provides greater specificity than the thick-film examination.

Sensitivity of thick blood film.

The expected sensitivity that can be achieved by an experienced microscopist for the examination of the thick blood film procedure is about 50 parasites/µl of blood (assuming a total RBC count of 5 x 10^6/µl of blood), which is equivalent to 0.001% of RBC infected.

Milne et al. found that most routine diagnostic laboratories generally achieved a lower sensitivity of detection (average, 0.01% RBC infected, 500 parasites/µl) in an examination of results from British laboratories submitted to the Malaria Reference Laboratory.

Observations and Results

The present study enrolled 100 patients with clinical suspicious malaria cases. Microscopy and RDTs was done in all patients. Out of 100 patients studied 40 patients were positive for malaria. There were 25 and 15 positive cases amongst males and females respectively.

Table1: Species wise distribution of malaria positive cases for microscopy & RDT

SPESCIES	MICROSCOPY(N=32)		RDTs(N=30)	
	NO.	%	NO.	%
PL.FALCIPARUM	21	65.63%	21	53.85%
PL.VIVAX	8	25%	11	25.64%
BOTH	3	9.38%	8	20.51%
TOTAL	**32**	**100%**	**39**	**100%**

Table 2: Comparison between diagnostic tests

DIAGNOSTIC TEST	NUMBER OF PT.
MICROSCOPY & RDTS BOTH (+)	31
RDTs(+)	8
MICROSCOPY(+),RDTs(-)	1
BOTH NEGATIVE	60
TOTAL	**100**

Table 3: Showing symptom analysis 40 confirmed malaria cases

SYMPTOMS	NO.OF PATIENTS	PERCENTAGE(%)
Fever,Chills and rigors	40	100%
Headache, Bodyache	33	82.5%
Fatigue	36	90%
Nausea,vomiting	21	52.5%
Giddiness	30	75%
Arthralgia,Mayalgia	2	5%
Abdominal pain	6	15%
Diarrhea	**0**	**0%**

Table-4 : Hematological parameters in 40 confirmed malaria cases

Parameters	No. of patients	Percentage
Anaemia	23	57.5
Thrombocytopenia	14	30.5
Leucocytosis	12	30
Granulocytosis	10	25
Lymphopenia	13	35.5
Monocytosis	9	22.5
Eosinophilia	5	12.5

Discussion

Malaria has always been the subject of research for medical practitioners from time immemorial. Although there have been substantial progress in the management of Malaria yet a lot has to be done to in malaria endemic zones of different parts of world. The present study was performed over a period of one year from Oct.2010 to Sept.2011 in 100 clinical suspicious malaria patients who comes to OPD of M.Y.H. Indore. The study had a majority of patients from Indore and surrounding region. Most of the patients were of low education and lo socio-economic status and from rural areas. In our study 13% of patients were illiterate without any type of formal education, 64% of patients were educated upto primary school or with some formal education, out of which 10 were female and 50 were male while only 27% of patient were educated more than 8th std. Increased no. of patient from rural areas and from crowded areas of city were found in almost all the study performed in India and across the world, this may be attributed to factors like stagnation of water, poor hygiene and low socio-economic status.(10-14)

In our study we found that 82.5% patients presented with headache & bodyache, 90% with fatigue, 75% with giddiness, 52.5% with nausea and vomiting(Table 4). A study by Andrej trampuz et al. on clinical review on severe malaria shows that the majority of patients experience fever (>92% of cases), chills (79%), headaches (70%), and diaphoresis (64%). Other common symptoms include dizziness, malaise, myalgia, abdominal pain, nausea, vomiting, mild diarrhea, and dry cough.(15)

In our study we found that anaemia, lymphopenia, throm bocytopenia was found in 57.5%, 35.5%, 30% cases respectively. Monocytosis (22.5%), eosinophilia(12.5%) was also not uncommon. The study done by Laura M.Erhart et.al. supports our findings.(16) An another study revealed that thrombocytopenia is the most common laboratory abnormality(60% of cases), followed by hyperbilirubinemia (40%), anemia (30%), and elevated hepatic aminotransferase levels (25%). The leukocyte count is usually normal or low, but neutrophilia with a marked increase in band forms (left shift) is present in the majority of cases.(15)

It is evident from the findings that the clinical profile of malaria and its laboratory findings haven't changed much. But there is a scope of further analysis of the results found in two different investigations in diagnosing malaria so that a definite conclusion may be made.

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