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Research Article

MALARIA ATTACKS DUE TO *PLASMODIAUM VIVAX* AT GANGAPUR, AURANGABAD DISTRICT (MAHARASHTRA) INDIA

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ABSTRACT

Objectives: we investigated the incidences of malaria in the rural areas of Gangapur which is Taluka place in the Aurangabad District of Maharashtra.

Methodology: Overall 4738 suspected patients were examined at Govt Hospital of Gangapur who were having high fever.

Conclution: At rural areas of Gangapur, the malaria patients are well below as prescribed by WHO. The main species involved is Plasmodiaum Vivax. Few cases of plamodiaum falciparum is aslo observed.

Keywords: Malaria Incidence, P vivax, p Falciparum, Gangapur.

INTRODUCTION

Malaria is a potentially deadly infection caused by protoxoan parasites in the *Plasmodium* genus. Infection is transmitted by the bite of an infected female, *Anopheles* sp. mosquito, resulting in erythrocyte infection and destruction [1]. Although once wide-spread, disease is not mostly limited to the tropics and subtropics worldwide, including many poor nations with limited resources and health care infrastructure.

The history of scientific discoveries in malariology begins from 1640 when the physician Huan Del Vego first employed the tincture of the cinchora tree bark for treating Malaria, although some theoretic properties of the cinchora bark where already known by that time since the aborigines of pew and Ecuador had been using it as an antipyretic. The first detailed description of the clinical picture of malaria and its treatment with the cinchora bark was presented by the Geneva physician Morton in 1696. The Italian Lancisi (1717) linked malaria with poisonous vapors of swamps (Mal aria bad spoilt air) from which the name of the disease took its origin malaria. In 1847, the German Scientist Meckel detected in leukocytes macrophages of malaria variants and also in their internal organs (at autopsy) brownish pigments whose presence is associated with malaria in 1880. The French physician Laveran in Algeria identified the causative agents of human malaria in 1884-1885; Danilevsky described the causative organism of avian malaria.

In 1897, Ronald Ross, working as a military physician in India, made another extremely important discovery, proving experimentally that mosquitoes serve as vectors of human and avian malaria [2].

The literature survey revealed that, though there are some reports of study related to malaria from India and rest of the world, but systematic study of malarial incidents from Marathwada region is not reported yet.

MATERIALS AND METHODS

Materials

For this investigation all glassware used were sterilized properly, all the chemicals were of analytical grade, a sterilized distilled water is used for the preparation of solution.

The blood samples of patients reported to Government Hospital at Gangapur town were collected during June 2010 to May 2013. These patients were suspected of malaria, suffering from fever advised for blood testing. The method used for the determination is given below [3,4].

Methods

1. The fingertip to be pricked was cleaned with spirit and dried with a piece of cotton wool. The finger was pricked at the side of tip with the needle or lancet. The blood is allowed to flow freely. The first drop of blood was discarded. The next drop was collected for examination.
2. Three drops of the blood was applied on the right-hand quarter of the slide. With the corner of another clean slide, the blood is spread to an even thickness in a round form of about 1cm diameter this give the thick film.
3. In order to prepare thin film of blood, a drop of blood was applied on the middle of the same slide. With the help spreader slide, the drop of blood is allowed to spread. The spreader was quickly pushed from the center to the left side of the slide, drawing the blood behind it. The film is allowed to dry in air. The film was labeled with patient's number.
4. When both the thick and thin films are dried, the thin film is immersed only in jar 1 containing methanol and rapidly removed taking care not to let the methanol touch the thick film then dried thoroughly in air. The thick and thin films are dipped in jar 2 containing JSB Solution II for 1-2 seconds. Then the slide was dipped twice or thrice in jar 3 containing buffered water to remove excess of eosin stain. Both the thick and thin films are immersed in jar 4 containing JSB Solution 1 for 45 seconds. The slides are dipped three to four times in jar 5 containing buffered water to remove excess of blue stain. It is dried in air on a draining rack (with the side with the smear facing down). The slide is examined. The smear appeared mauve. This will enable a malaria trophozoite to be recognized.
5. (a) The thin film is fixed only by dipping in methanol for 2-3 minutes, dried in air. A 1 in 10 dilution of Giemsa stain is made. Mixed gently with a glass rod. The slides are placed across 2 glass rods. Covered them with diluted Giemsa stain. Allow to stand for 30 minutes. The stain was washed off with buffered water. The water is drained off. The slides are placed in a rack to dry, in a sloping position with the stained films facing downwards to protect them from dust in the air. (b) The slides are picked up with forceps one by one and slotted them into the rack of the staining trough, in a Z pattern. The staining trough is filled with stain slowly and left for 30 minutes out of the sunlight. The cover is remade poured clean water from a beaker into the trough to remove the deposit on the surface of the staining solution. Gently paired off all the staining solution from the trough.

Table 1: The positive cases of *P. vivax* and *P. falcipurum* during 2010

Serial number	Month	Total sample collected	*P. vivax*	*P. falcipurum*	Total
1	June 10	115	1	0	1
2	July 10	122	1	0	1
3	August 10	198	1	1	2
4	September 10	98	1	0	1
5	October 10	114	1	0	1
6	November 10	102	1	0	1
7	December 10	108	1	0	1

P. vivax: Plasmodiaum vivax, P. falciparum: Plasmodiaum falcipurum

Table 2: The positive cases of *P. vivax* and *P. falcipurum* during 2011

Serial number	Month	Total sample collected	*P. vivax*	*P. falcipurum*	Total
1	January 11	108	1	0	1
2	February 11	105	1	0	1
3	March 11	100	0	0	0
4	April 11	119	1	0	1
5	May 11	148	1	1	2
6	June 11	203	1	1	2
7	July 11	218	1	1	2
8	August 11	214	1	1	2
9	September 11	220	1	1	2
10	October 11	125	1	0	1
11	November 11	121	1	0	1
12	December 11	130	1	0	1

P. vivax: Plasmodiaum vivax, P. falciparum: Plasmodiaum falcipurum

The staining trough was filled with buffered water. The slides were taken out one by one, using forceps. Dipped each slide in a beaker of ordinary water, gently, and hence that the stained preparation does not become unstuck. The slides are drained, placed them in the rack to dry (the slide with the blood film facing downwards).

RESULTS AND DISCUSSION

The parasites that cause malaria are found in the blood; part of their development takes place within the red blood cells. Malaria parasites are detected in blood films stained by the JSB or Giemsa stain. The parasites are usually most numerous in the blood towards the end of an attack of fever. Therefore, the blood samples were always collected before antimalarial drugs are given. A drop of blood from the finger is placed on a slide, spread and dried. During staining of the drop of dried blood, the hemoglobin in the red blood cells dissolves and is washed out by the water in the staining solution. All that remain are the malaria parasites and the white blood cells, which are observed under the microscope. The thick film method makes it possible to find parasites more quickly and if there are only a few present.

Areas where systems of irrigation are being developed and where the number of mosquito vectors of malaria is an on increase may also be potentially dangerous. This phenomenon may be well illustrated by an example of South East Turkey where irrigation agriculture had led to the outbreak to severe epidemics of *vivax* malaria. In a number of countries where the large scale use of insecticides has been discontinued following malaria eradication, mosquito population of the genus *Anopheles* have been restored. This is the main cause underlying the so-called post-elimination epidemic breaking out in several countries where malaria had been practically eliminated the most significant of these outbreaks have occurred in Pakistan, India and Sri Lanka [5].

Thus, the major requirement for preventing unfavorable clinical and epidemiological implications of malaria imposed in this country from its

Table 3: The positive cases of *P. vivax* and *P. falcipurum* during 2012

Serial number	Month	Total sample collected	*P. vivax*	*P. falcipurum*	Total
1	January 12	102	1	0	1
2	February 12	98	1	0	1
3	March 12	138	1	1	2
4	April 12	138	1	0	1
5	May 12	109	0	1	1
6	June 12	116	0	1	1
7	July 12	132	1	1	2
8	August 12	192	1	1	2
9	September 12	102	0	0	0
10	October 12	111	1	0	1
11	November 12	126	1	1	2
12	December 12	118	1	1	2

P. vivax: Plasmodiaum vivax, P. falciparum: Plasmodiaum falcipurum

Table 4: The positive cases of *P. vivax* and *P. falcipurum* during 2013

Serial number	Month	Total sample collected	*P. vivax*	*P. falcipurum*	Total
1	January 13	128	1	0	1
2	February 13	105	1	0	1
3	March 13	101	0	0	0
4	April 13	116	1	0	1
5	May 13	138	1	1	2

P. vivax: Plasmodiaum vivax, P. falciparum: Plasmodiaum falcipurum

epidemic areas consists in the early detection and treatment of patients suffering from this disease. Therefore, it is practically important to know the clinical pictures of the disease and the contemporary methods of its treatment [6].

Globally, *Plasmodium falciparum* is responsible for the majority of uncomplicated febrile illness, as well as severe and fatal malaria and has malaria (Table 1-4). Despite this, *Plasmodium vivax* is a major cause of morbidity, accounting for almost half of all malaria cases outside of Africa. Each year, there are between 10 and 390 million clinical *vivax* infections.

Gangapur is a town place with population of around 41067. The study period varied from January 2010 to May 2013. The blood samples of 4738 patients during this period were examined for *P. vivax* and *P. falcipuram*. The total cases found positive for these two species are 31 and 14, respectively. The overall percentage is around 0.65% and 0.295 %.for *P. vivax* and *P. falcipuram* respectively. This indicates that the dominating of *P. vivax* cases. The positive cases for *P. falcipuram* was found to be in the month of August 2010, May 2011 to September 2011, March 2012, May 2012 to August 2012, November 2012, December 2012 and May 2013.

This indicates that *P. vivax* is observed in all seasons (Rainy, winter and summer) whereas *P. falcipuram* in summer and early rainy seasons. This may be environmental condition and or climatic condition.

In conclusion at rural areas of Gangapur, the malaria patients are well below the level prescribed by WHO. The main species involved is *P. vivax*. Few cases of *P. falcipuram* is also observed.

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