

# GENDER AND AGE-WISE INDICES OF PLASMODIUM SPP. IN MAUGANJ OF REWA CITY M.P.

Dharmendra Kumar Patel<sup>1</sup>, \*Dr. Devendra N. Pandey<sup>2</sup>,  
Gaurav Yadav<sup>3</sup> and Dr. Sandeep K. Shukla<sup>4</sup>

1. School of Environmental Biology

3. Department of Biotechnology  
A.P.S. University, Rewa, (M.P.)

2. Department of Zoology

Govt. S.K.N.(P.G.) College, Mauganj, Rewa (M.P.)

4. Govt. Maharaja P.G. College, Chhatarpur (M.P.)

Email- sandeepshukla910@gmail.com

## ABSTRACT:

Malaria is caused by protozoan parasites of the genus *Plasmodium* and is a major cause of mortality and morbidity worldwide. These parasites have a complex life cycle in their mosquito vector and vertebrate hosts. The primary factors contributing to the resurgence of malaria are the appearance of drug-resistant strains of the parasite, the spread of insecticide-resistant strains of the mosquito and the lack of licensed malaria vaccines of proven efficacy. Malaria leading cause of morbidity and mortality in tropical and sub-tropical countries. About 36% of the world population, i.e. 2020 million is exposed to the risk of contracting malaria in 90 countries. A search for local studies at Mauganj PHC located at Rewa city (M.P.). The aim of study was to review the microscopy Giemsa method detects parasites in thin and thick blood smear which help us to quantify the parasites load in patient presenting at PHC during August 2012 to July-2013. In this paper we concluding which gender and which age are highly infected by malarial infection. In year between Aug-12 to July-13 65.96% (188/285) male infected with *P. vivax* parasite detected in blood smear and 27.71% (79/285) are female patients suffering by *P. vivax*. Also this year 6.31% (18/285) patients reported of *P. falciparum*, out of which 4.91% (14/285) male and 1.40% (4/285) is female patients. Also this study estimated using blood positive data classified both gender wise and age wise. Over all study we are concluding that both species are highly infected male then female, also this study

concluding age above 15 year are highly infected by both plasmodium species.

**KEYWORD:** Malaria infection, *P. vivax*, *P. falciparum*.

## INTRODUCTION:

Malaria is one of the most common infectious diseases and a great public health problem worldwide, particularly in Africa and south Asia. About three billion people are at risk of infection in 109 countries. Each year, there are an estimated 250 million cases of malaria leading to approximately one million deaths, mostly in children under five years of age. The organism that causes the most dangerous form of malaria is a microscopic parasite called *Plasmodium falciparum*.

In India the burden of malaria infection is generally higher in males than females in all age groups. (Dutta *et al* 1999, Das *et al* 1997). In some societies, men have a greater occupational risk of contracting malaria than women if they work in mines, fields or forests at peak biting times, or migrate to areas of high endemicity for work. (Reuben R *et al* 1993). Women who get up before dawn to perform household chores may also be exposed to mosquitoes and consequently to malaria infection (Vlassoff C *et al* 1998). In some societies men tend to sleep outdoors and this may increase their risk of exposure to mosquitoes (Rahman S *et al* 1995). Male puberty is main feature an array of physiological and behavior changes. Some study find an increased incidence of clinical malaria

with the onset of puberty in males but not in females. Male behavior occurring post puberty such as alcohol and tobacco consumption (Benegal V et al 2005). Could also contribute to the increasing incidence of clinical malaria in post pubertal males. Beer consumption has been linked to increased attractiveness for An Gambians (Lefevre T 2010), also chronic alcohol consumption is likely to cause dysfunction of the liver, an organ important in conferring resistance to both liver and blood stage of malaria disease (Balmer P et al 2000, Mannoor MK et al 2002). Conversely, lower nutritional status of and prevalence of anemia in post pubertal female could influence the incidence of clinical malaria in them, iron deficiency anemia has been showed to be significantly more common in adolescents Indian girls the boys. (Basu S et al 2005).

### Patients

This was a prospective study carried out at the Mauganj city Rewa (M.P.) PHC Aug-2012 to July 2013. Sixteen thousand seven hundred forty eight patients form both gender and all age groups with clinical suspicious of malaria having history of fever at the time presentation associated with shivering in some cases and with other non-specific symptoms like body ache, headache, fatigue and abdominal discomfort were included in the study.

### MATERIALS AND METHODS

Use universal precaution while preparing the smears for malarial parasites. Use gloves, use only disposable needles/lancet wash hands, handle and dispose the sharp instruments and other material contaminated with blood carefully to avoid injury. Since parasite concentration is fairly in internal and peripheral blood, it is routine to draw the blood by pricking a finger with a sharp sterile needle three drop of finger prick blood sample were used for the thick smear, one drop was used for thin blood smear.

### Microscopy of Giemsa stained blood films.

Gustav Giemsa in 1904 developed a mixture of methylene blue and eosin stain which has subsequently became the gold standard. Giemsa microscopy is regarded as the most suitable diagnostic instrument for malaria control because it is relatively inexpensive cost estimate for endemic countries range from about US \$ 0.12-0.40 per slide (Palmer et al 1998). Thick and thin blood smear were stained with Giemsa (PH 7.2). Thin blood smears allow better species identification, because the appearance of the

parasites is better preserved in this preparation. Thick blood smears allows screening of a larger volume of blood and, therefore, they can give more than ten-fold increase sensitivity over thin films. Thickness of film important differentiating between species, quantification of parasitaemia, and observation of asexual stage of the parasite.

### RESULT

The study period in PHC Mauganj during Aug-2012 to July-2013, a total of 8012 patients presented with fever or history of fever, out of this 3.55%(280/8012) patients infected with both plasmodium species *P.vivax* and *P.falciparum*. Out of this 93.68% (267/285) *P.vivax* parasite detect in patients' blood smear and 6.31% (18/285) *P. falciparum* parasites detect in blood smear by microscopy method.

Table No. 1

Year	Total no. of positive result of <i>P. vivax</i>	Gender	
		Male	Female
Aug. 2012 to July 2013	267	188	79

In year Aug-12 to July-13 93.68% patients suffering from *P. vivax*, out of this 65.96% male patients positive and 27.71% female patients positive. Giemsa stained microscopy blood smear positive patients distribute in gender wise also distribute in age wise see under the table.

Table No.2

Age wise distribution result Aug-12-Jul-13

P. vivax result Aug-12 to July-13				
Gender	positive case	Age in year		
		0-4 year	5-14 year	≥ 15 year
Male	188	1	18	169
	65.96%	0.35%	6.31%	59.29
Female	79	1	16	62
	27.71%	0.35%	5.61%	21.7%

In year Aug-12 to July-13 8012 patient's blood sample collected out which 93.68% cause *P. vivax* infection in both gender. This result indicted age and gender wise distribution of malarial infection shows that the male are highly infected comparatively then female, also in both gender age above 15 year are highly infected comparatively then age 0-4 year and 5-14 year.

In year Aug-12 to July-13 6.31% detected *P. falciparum* in patients' blood sample by microscopy method this result gender wise classification as blow table no. 3

**Table No. 3**

Gender wise classification of <i>P. falciparum</i> result of Aug-12 to July-13			
Year	Total no. of positive	Gender	
		Male	Female
Aug. 2012 to July 2013	18	14	04
		4.91%	1.40%

Out of positive 4.91% are male exposure of *P. falciparum* and only 1.40% of female in Aug-12 to July-13 exposure of *P. falciparum*. Gender wise and age wise distribution show as below table no. 4:

**Table no. 4**

<i>P. falciparum</i> result Aug-12 to July-13				
Gender	positive case	Age in year		
		0-4 year	5-14 year	≥ 15 year
Male	14	0	0	14
	4.91%	0		4.91%
Female	04	0	02	02
	1.40%	0.35%	0.70%	0.70%

Aug-12 to July-13 only 6.31% detected by infection of *P. falciparum* plasmodium, out of which 4.91% male exposure of this plasmodium in age above 15 years and 0.70% female exposure of this plasmodium in age 5-14 years as well as above 15 years.

#### DISCUSSION

Determine malaria parasite exposure at Mauganj PHC located at Mauganj Rewa city. In year Aug-12 to July-13 93.68% patients exposure by *P. vivax* parasites, out of which 65.96% male patients detected, out of this 0.35% patients age between 0-4 years, 6.31% patients age between 5-14 years and 59.29% patients age above 15 years in case of female patients 27.71% are detected, out of which 0.35% patients age 0-4 years, 5.61% patients age 5-14 years and 21.75% patients age above 15 years. Also this year 6.31% patients exposure by *P. falciparum* parasites in blood smear, out of which 4.91% male patients detected, out of this all patients are

age above 15 years while in case of female 1.40% detected, out of this 0.70% patients age between 5-14 years and 0.70% age above 15 years. Over all study we are concluding that male are highly infected then female also age above 15 years in both genders.

#### ACKNOWLEDGEMENT

Authors are thankful to Dr. B.P. Mishra, (CMO) Mauganj, Rewa (M.P.), Dr. Devendra Nath Pandey, Professor of Zoology, Govt. S.K.N. (PG) College, Mauganj, Rewa M.P. and Dr. Sandeep K. Shukla Govt. Maharaja P.G. College, Chhatarpur M.P. for their valuable support.

#### REFERENCES:

- Balmer P, Alexnder J, Philips R S (2000) protective immunity to erythrocytic plasmodium chabuadi as infection involves IF Ngamma-mediated responses and a cellular infiltrate to the liver. *Parasitology* 5: 473-82
- Basu S, Hazarika R, Parmar V (2005) Prevelence of anemia among school going adolescents of Chandigarh. *Indian peidatr* 42:593.7.
- Benegal V (2005) India : alcohol and public health. *Addiction* 100:1051-6 doi:10.1111 /j. 1360-0443. 2005,01176.
- Das N G, Baruah I, Kamal S, Sarkar P K, Das S C, Santhanam K., An epidemiological and entomological investigation on malaria out break at Tamalpur PHC Assam *India J malatia* 1997:34:164-70.
- Dutta, P. Khan A M, Mahanta J, Problem of malaria in relation to socio-cultrtral diversity in some ethnic communities of Assam, arunachal Pradesh. *J parasitic Dis* 1999:23:101-4.
- Lefevre T, Gouagna L C, Dabire K R, Elguero E, Fontenille D, et al (2010) Beer consumption increase human attractiveness to malaria mosquitoes. *Plos one* 5:e 9546. Doi : 10.1371/journal. Pone.009546.
- Mannoo M K, Halder R C, Morshod S R, Ariyasinghe A, Bakir H Y, et al (2000). Essential role of extrathymic T. cell in protection against malaria *J immunol* 169:301-6.
- Palmer C J, Klaskala W I, Lindo J. F., Evaluation of the Optimal test for rapid diagnosis of *P.v* and *P.f* malriar *J.clin microbial* 1998: 36: 203-206.
- Rahman S et al., Gende4r aspects and womans participation in the control and management of malaria in central sudan. *Social science and medicine*, 1995,42(10).

10. Reuben R. Women and malaria special risk and. Appropriate control strategy social science and medicine, 1993,37(4):473-480.
11. Vlassoff C, Manderson L. Incorporating gender in a anthropology of infectious diseases. *Tropical medicine and international Health*, 1998, 3(12):1011-1019.