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Sex wise incidence of *Plasmodium vivax* and *Plasmodium falciparum* in maval

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ABSTRACT

Malaria is caused by a protozoan belonging to the genus, *Plasmodium* with five species: *Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium ovale*, *Plasmodium malariae*, and *Plasmodium knowlesi* that infect humans (WHO, 2012). Globally, an estimated 3.3 billion people are at risk of being infected with malaria and developing disease, and 1.2 billion are at high risk to acquire the disease. A retrospective study was carried out at a tertiary care PHC center in Maval. The sex wise incidence of Malaria due to *Plasmodium vivax* and *Plasmodium falciparum* showed a similar pattern having more incidences in males than females during both the years 2013-2014 (677 males > 390 females) and 2014-2015 (891 males > 562 females) respectively.

Key words: Sex wise *Malaria*, Maval.

INTRODUCTION

Malaria is a major public health problem and it is estimated that about 75% of the landmass of Ethiopia is malarious and 68% of the Ethiopian population, estimated at about 54 million live in malaria risk areas in 2010 (FMH,2010). Several species of Malaria cause extensive clinical and pathological damage to human being, and thus Malaria having attracted the attention of many researchers. A detailed study on Malaria has increased its biological and medical importance. In view of this the study was initiated to record the prevalence of Malaria in Aurangabad District. Several researchers like, Basettia et. al. 2000, Nevill et. al. 1993 and Robert et. al. 1992-1993 contributed to this area of research.

Global Malaria Action Plan (GMAP) outlined the strategies, goals, timelines and expenditure for global malaria control and elimination. The GMAP was developed by the Roll Back Malaria (RBM) Partnership and endorsed at the

Malaria Summit on 25th September, 2008, in New York City. The GMAP outlines a three-part global strategy. One important feature of Pf infections, especially in areas of high transmission intensity, is that an individual could be concurrently infected with multiple, genetically -distinct clones of Pf. Multiclonality has been reported to influence the duration and outcome of infections, but these associations have been contradictory among studies. For example, severe malaria was significantly associated with high complexity of infection (COI) in Uganda, while a reduced risk of clinical malaria was associated with polygenomic *P. falciparum* infections in Papua New Guinea.

The clinical manifestation of *Plasmodium* infection varies from asymptomatic to severe and fatal malaria in endemic areas. On the other hand, asymptomatic infections can be associated with high levels of gametocytes, and likely serve as an important parasite reservoir, and it has a significant contribution by maintaining parasite for the transmission (Makanga, 2014). *P. vivax* cases vastly outnumbered *Plasmodium falciparum* cases throughout the study period. In concordance with our findings, Anvikar AR et al reported that malaria in India was predominantly caused by *Plasmodium vivax*, accounting for 53% of the estimated cases. After the spread of drug resistant *Plasmodium falciparum* in the 1990s, the prevalence of the two species remained equivalent at the national level for a decade. By 2014, the proportion of *P. vivax* had decreased to 34% nationally, but with high regional variation. In 2014, *P. vivax* accounted for around 380,000 malaria cases in India; almost a sixth of all *P. vivax* cases reported globally. Urban malaria is predominantly caused by *P. vivax*. There is paucity of data regarding such studies in urban outskirts. In view of this the present study was initiated to record the prevalence of Malaria in Maval.

MATERIAL AND METHODS

The techniques used during the present study are from the Manual for Laboratory technician published by Directorate General of Health Services (1985), which is a modification of the manual of basic techniques for Health Laboratory published by WHO (1980), it is a revised version of an earlier manual by Etienne Levy Lambert (1974).

The material for the study of Malaria of Human was obtained from different places, in around the Maval.

RESULTS AND DISCUSSION

Several workers have reported a monsoon peak of overall malarial incidence whereas in this study, a post monsoon peak has been noted in three consecutive years (from 2014-16) This upsurge in 2016 is noted in this study as well as government records reflect the fact that the ongoing vector control measures, though extensive, are turning practically inefficient. The cause may be vector resistance to insecticides as documented by Liu N et al.

The Sex Wise incidence of malaria due to *Plasmodium vivax* and *Plasmodium falciparum* showed a similar pattern having more incidence in males than females during both the years.

2013-2014	Males (677)	>	Females (390)
2014-2015	Males (891)	>	Females (562)

Table – 1 : Sex wise Distribution of Positive P. vivax and P. falciparum during 2013-2014

Name of the Center	Sex Wise			Positive		
	Male	Female	Total	P.V.	P.F.	Total
Adale	00	00	00	00	00	00
Karla	02	02	04	03	01	04
Khadkala	00	00	00	00	00	00
Takave	00	00	00	00	00	00
Talegaon	01	00	01	01	00	01
Yelase	674	388	1062	528	534	1062
Total Maval Block	**677**	**390**	**1067**	**532**	**535**	**1067**

Table – 2 : Sex wise Distribution of Positive P. vivax and P. falciparum during 2014-2015

Name of the Center	Sex Wise			Positive		
	Male	Female	Total	P.V.	P.F.	Total
Adale	00	00	00	00	00	00
Karla	520	412	932	920	12	932
Khadkala	364	149	513	513	00	513
Takave	01	00	01	01	00	01
Talegaon	00	00	00	00	00	00
Yelase	06	01	07	07	00	07
Total Maval block	891	562	1453	1441	12	1453

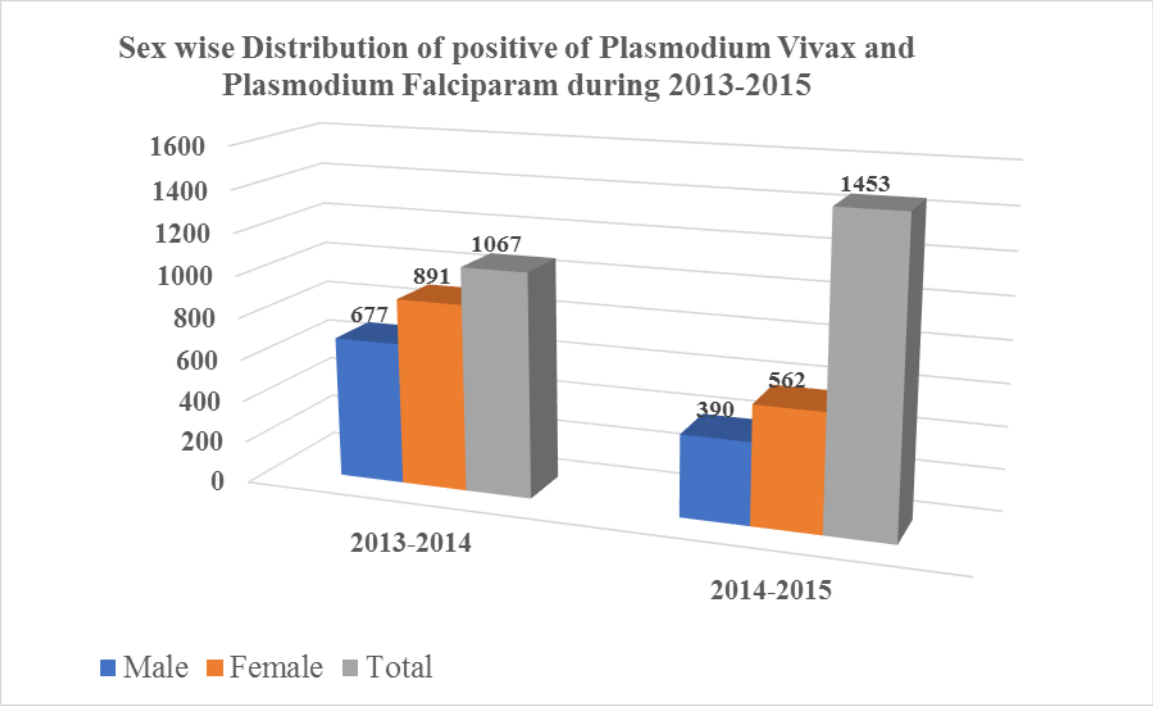

Fig. 1: Graphical representation of Sex wise Distribution of positive of Plasmodium Vivax and Plasmodium Falciparum at various sites of Maval region is presented below.

During the year 2013-2014 of 1067 positives 677 positive were from males and 390 from females. The species wise break up of positives showed a pattern of incidence of *P. vivax* 532 and *P. falciparum* was 535.

Sex wise incidence of P. vivax and P. falciparum during 2014-2015 showed that out of 1453 positives, 891 were from males and 562 positives were from females. The species wise break up of positives showed that the incidence of *P. vivax* was 1441 and *P. falciparum* was 12.

The call of the hour is to strengthen the vector control measures, promote early treatment of fever cases, and ensure the treatment compliance as well as expedite detection of drug resistance and reinforce surveillance measures to tackle this unanticipated flutter of resurgence. Further genetic studies such as mutation among Plasmodium spp. against antimalarial drugs, vector resistance to conventional control measures, is to be performed to explain the cause of resurgence. Also, we could not consider the asymptomatic undiagnosed cases while estimating the case load.

Sex wise distribution showed that the incidence was more in males that females. The incidence of percentage of *P. vivax* is more than in P. *Falciparum*.

Sex wise incidence of *P. vivax* and *P. falciparum* is depicted in Table 1 and 2 and figure 1.

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