



VARIATIONS OF HUMAN MALARIAL INFECTION IN DIFFERENT LOCALITIES OF DISTRICT KILLA SAIFULLAH BALOCHISTAN PROVINCE

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N.J.U carried out this study M.I.Y revised the experiment and finalized the data.

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ABSTRACT

Malaria is one of the most major health problems particularly in developing countries, including Pakistan burden of disease is high. The malaria is a vector borne disease caused by plasmodium. There are five spp. of malaria includes *P. falciparum*, *P. vivax*, *P. malariae*, *P. ovale* and *P. knowlesi*. *Plasmodium falciparum* and *Plasmodium vivax* is the common malaria specie's in Pakistan. A total of 4208 blood smears were prepared from the above residing in twelve different localities of district Killa Saifullah variations were observed among different localities. The overall incidence of Plasmodium slide positivity was 20.0 %. However, *P. vivax* was found to be higher 70.5% as compared to *P. falciparum* 34.7 % and mixed infection 0.47%. The highest 70.5 % of *P. vivax* was observed in locality of Dolatzai and lower in Nalisar 48.9 %. While, gender wise prevalence shows higher in male i.e 78.6% as compared to female i.e 26.1% respectively.

1. INTRODUCTION

Malaria is one of the most harmful diseases to the human and still it is a challenging problem not only for Pakistan but for the rest of the world. It is especially, a burden for developing or less developed countries [1]. It is considered the third leading causing of deaths in the population and the fourth of all historic periods. Malaria is still the major cause of morbidity and mortality in least developed regions. Until recently, only the four Plasmodium species (*Plasmodium falciparum*, *P. vivax*, *P. ovale* and *P. malariae*) were recognized as the only etiological agents of human malaria. But recently *P. Knowlesi*, a simian parasite, is also considered as human malaria parasite and included as the fifth malaria parasite [2]. *P. falciparum* and *P. vivax* have worldwide distribution, with *P. falciparum* being the more pathogenic. Few years back, it was indicated that about 1-3 million mortality per year, mainly in children and pregnant women are due to severe malaria infection caused by *P. falciparum* [3, 4, 5]. However, according to the

latest estimates released by world health Organization (WHO). There were about 198 million cases of malaria in 2013 and an estimated 584,000 deaths. The same report showed reduction of malaria associated death rates among biologically risked groups in Africa by an estimation of 47% globally since 2000 and 54% in the WHO African region [6, 7]. Temperature, fever, chills, vomiting etc. was including in this study. Those patients which do not have general symptoms of malaria were excluded from the current study. The data were symptoms of malaria were excluded from the current study. The data were collected from different health care centers/Rural health centers, basic health unit (BHU) and hospitals of the district. Blood is the only material which is routinely used for the direct detection of malaria parasites in population. Standard WHO recommended methodology were used during this investigation. Malaria cases are generally detected in Two ways PCD (passive case detection) this is done by examining the blood of patients presenting themselves to a health station with symptoms and signs of malaria or ACD (active case detection) this is done by making home visits and examining the blood of persons

with symptoms, signs or a history suggestive of malaria present or in recent past.

2. MATERIALS AND METHODS

2.1 Study Area and Sampling

The study was carried out to find the prevalence rate of malaria among local population of Killa Saifullah District and to assess the species wise distribution. This study was conducted during 1st June 2016 to 31st May 2017. The inclusive and exclusive were defined. The patients have Films species of parasites can be identified in *falciparum* malaria, the presence of gametocyte crescent make species Identification simple. According to Paniker. [8, 9]. Many tests have been developed, but none can replace the thick and thin smear which alone can reveal the parasite morphology clearly enough for accurate identification of the species. A careful and patient smear examination still remains as the 'gold standard' in malaria diagnosis [10]. *Plasmodium* species identification was made following the keys furnished by [11, 12, 13]. *P. vivax* and *P. falciparum* were distinguished by the structure of trophozoites and gametocytes.

2.2 Blood Film Examination Field and Laboratory Studies in Parasitology

Seasonal preparation of blood slides, both thick and thin film were made twice during each month from each resident and Giemsa stained slides were examined in the Lab for parasites.

2.3 Identification of Malaria parasite

Prepared thick and thin slides were further examined in the lab for species identification.

A. Preparation of a thin blood film

A thin blood film was made by a spreading of drop of blood evenly across of a clean grease free slide, using a smooth-edged spreader.

B. Preparation of thick blood film

Thin smear was used for describing blood cells. The thick smear was used for detecting malarial parasites and microfilariae. A large drop of blood was taken on the centre of a slide and with the aid of a needle or a slide corner spread the drop over 1/2 an inch square area when dry the thickness, should be such that printed matter can

be seen through it.

2.4 Fixation of blood film

Before staining, the blood films need to be fixed with acetone free methyl ethyl Alcohol for ½ to 1 minute. The stained blood slides were examined under oil immersion microscope. The thick film shows the presence or absence of malarial parasites in 1 or 2 fields, but in thin calculated as 10.155 as compared with the table value χ^2 is less than the table value so it is concluded that there is No association between type of infection and various studies.

2.5 Statistical analysis:

(Based on the chi-square-test) formula mentioned by Neil, WA.1982). The data were statistically analysed to test if there exists any Association between types of infection and age group through a chi-square test formula mentioned below;

$$\chi^2_{cal} \Sigma = \frac{(fo-fe)^2}{fe}$$

Type of Infect

$$\chi^2_{cal} \Sigma = \frac{(fo-fe)^2}{fe} = 10.675$$

$$\chi^2_{tab} = 19.675 \text{ At 5\% level of significance}$$

The tabulated value of tab = 19.675 if the xcal= 10.155 value is less than the table value, it means that there is no association between types of infection (*P. vivax* & *P. falciparum*)

3. RESULTS

A total No. of 4208 Blood smears were prepared from the above residing in 12 different localities of district Killa Saifullah. However, variations were observed among different localities having different hygienic conditions. The present study of Killa saifullah district in (Table 1, 2). The overall incidence of plasmodium slides positivity was 20.0% Where in *P. vivax* was observed to be higher as compared with *P. falciparum* 64.7%. In (Table1). The highest 70.5%age of *P. vivax* found in killi Dolatzai but lowest ratio was found 48.9% in locality of Nalisar. We can say that the incidences of any type of Infection can happen irrespective of any study area independently

Table 1: Locality wise prevalence of malaria Infection in District Killa saifullah.

S.No	Localities	Total No. of slide examined	Total No. of +ve slide	<i>P. vivax</i>	<i>P. falciparum</i>	Mix Infection
1	Killa Saifullah	606	112	66 (58.9%)	45 (40.1%)	01 (0.89%)
2	Shinkai	231	47	32 (65.3%)	17 (34.6%)	00
3	Margha faqirzai	208	45	30 (66.6%)	15 (33.3%)	00
4	Bathozai	311	73	47 (64.3%)	25 (34.2%)	01 (1.36%)
5	Nalisar	422	83	59 (48.9%)	24 (28.9%)	00
6	Killi wobashta	362	70	42 (60%)	28 (40%)	00

7	Muslim Bagh	531	104	64 (61.5%)	39 (37.5%)	01 (0.96%)
8	Akhtrezai	245	40	28 (70%)	12 (30%)	00
9	Kan Mahterzia	391	98	62 (63.2%)	36 (36.7%)	00
10	Sharan Jogizai	333	69	46 (66.7%)	23 (33.3%)	00
11	Gwal ismail	267	65	45 (69.2%)	19 (29.2%)	01 (1.53%)
12	Therkha Dolatzai	301	34	24 (70.5%)	10 (29.4%)	00
Total		4208	842(20.0%)	545(64.7%)	293(34.7%)	04(0.47%)

Table 2: Sex wise prevalence of malaria infection in Killa saifullah.

S. No.	No. of slide examine	Total No. of slide +ve	Total No. of male	Total No. of female
1	4208	842	622(78.6%)	20(26.1%)

S.No.	A		B		C		Total
	(fo)	(fe)	(fo)	(fe)	(fo)	(fe)	
1	66	72.49	45	38.97	01	0.53	112
2	32	31.71	17	17.05			49
3	30	29.12	15	15.65			45
4	47	47.25	25	25.40	01	0.34	73
5	59	53.72	24	88.88			83
6	42	45.30	28	24.35			70
7	64	67.31	39	36.15	01	0.49	104
8	28	25.89	12	13.91			40
9	62	63.43	36	34.10			98
10	46	44.66	23	24.10			69
11	45	42.07	19	22.61	01	0.30	65
12	24	22.00	10	11.83			34

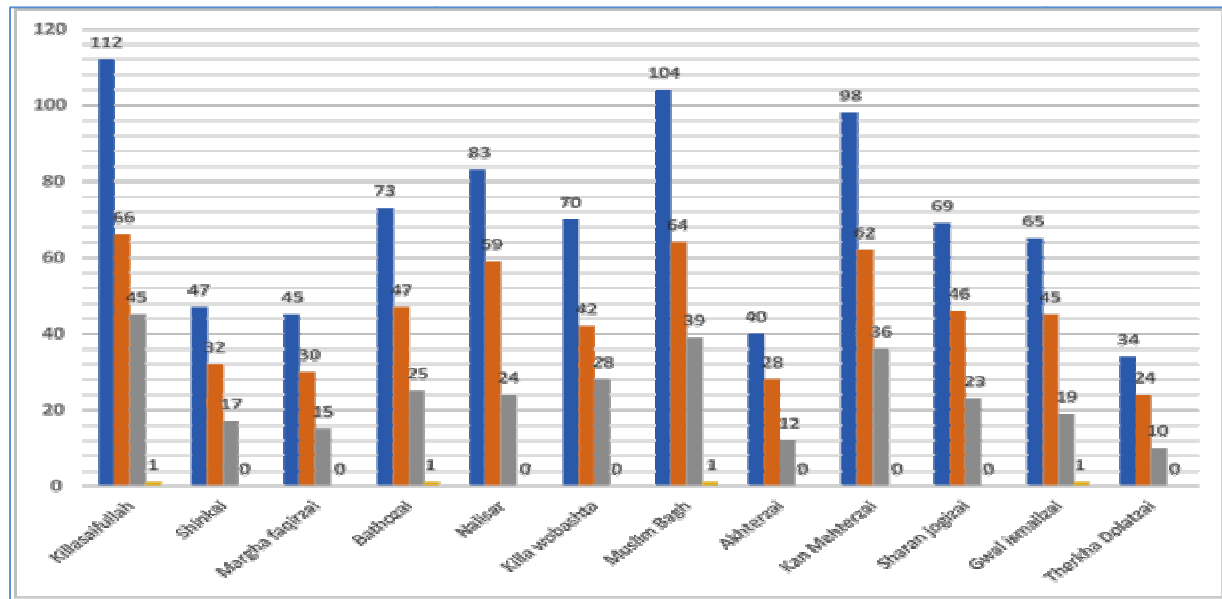


Figure 1. Locality-wise prevalence of human malaria infection in District Killa Saifullah.

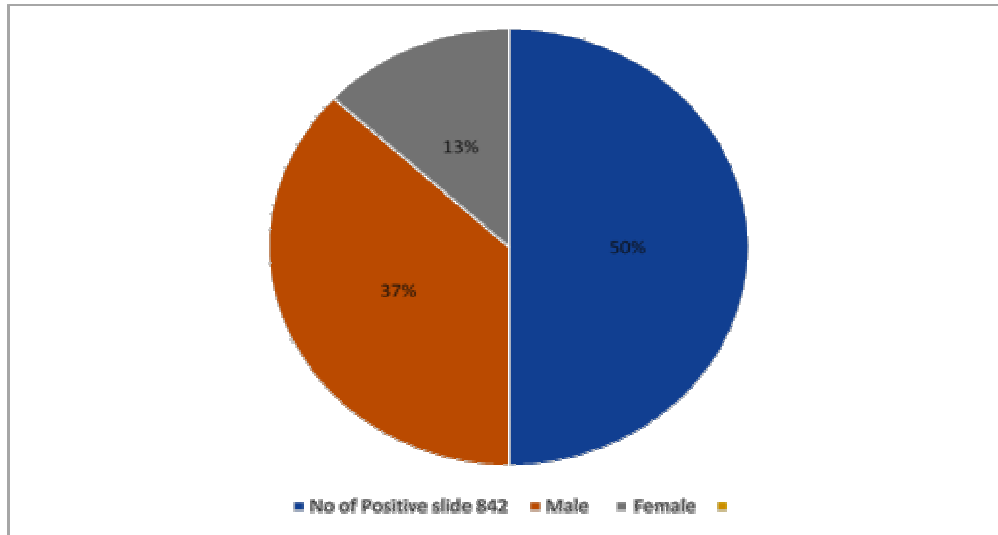


Figure 2. Sex-wise Prevalence of human malaria infection in District Killa Saifullah.

4. DISCUSSION

Our result shows that *P. vivax* to be the communist Species in the present study with the higher prevalence of (64.7%) and the same was observed by malaria control program. It was found that majority of the study participant were residing in the peripheral or rural areas of district Killa saifullah. Similar findings have been reported by the previous literature from Zimbabwe and rural Africa [14, 15]. It is probably due to the fact that people in rural areas are at high risk of mosquito bite as they sleep in open areas and work in the agricultural fields where they are exposed to mosquitoes and in rural areas the open pond are also in close vicinity of the resident [16]. *P. vivax* was most common (64%) as compared to *P. falciparum* (36%). Increased frequency of *Plasmodium vivax* malaria was recorded in other parts of the country i.e. OKara (98%), 90.4% in Muzaffarabad, Multan (64.7%) and Kohlo (88.5% and 58.9%), ACD and PCD (64.7%) in Ziarat [17]. In the present study gender, wise significantly higher proportion of males 622(78.6%) had malaria as compared water bodies for biological control. 7. Human has protected himself from the bites of mosquitoes by using residual homes sprays, repellents and very fine mesh fly screens to females 220(26.1%). The same as reported from KPK that 70% males and 30% female patients were monitored. Males were affected mostly, due to the reasons males being more active and are exposed from sunrise to sunset [18].

5. CONCLUSION

It is concluded that *P. vivax* was more prevalent in locality of Dowlatzai in the present study as compared with *P. falciparum* in District Killa Saifullah Balochistan.

6. CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the publication of this manuscript.

7. RECOMMENDATION

The following recommendations were made for survey Control and prevention of malaria.

1. General survey of the whole population twice in a year may be made, for adult larval forms of mosquitoes.
2. In destruction of mosquitoes breeding slides and its elimination may be managed. Awareness of the people about malaria infection and properties against mosquitoes.
3. Proper living hygienic facilities may be provided to the local population.
4. Provision of sanitary and daring conditions particularly in rural areas needs special attention.
5. Arrangement of spraying campaigns may be managed to control the mosquito vectors may be malaria control program of the province.
6. Larvivorous fishes may be introduce in the nearly

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