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Research Article

**THE OCCURRENCE OF MALARIA INFECTION IN THE
POPULATION OF MULTAN, PUNJAB**¹Dr Khadeeja Safdar, ²Dr Sidra Ahmed, ³Dr Sana Bashir¹Nishtar Hospital, Multan.

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Abstract:

Objective: The purpose of this research work is to find out the occurrences of the infections due to malarial parasites in the populations of Multan city.

Methodology: The parasites of malaria were diagnosed in the slides of blood of patients of these infections from the start of July 2016 to June 2018 and this research included three thousand four hundred and seventy-one patients. Both procedures of PCS (Passive Case Detection) & ACD (Active Case Detection) were in utilization for the diagnosis of malaria patients.

Results: Out of three thousand four hundred and seventy-one malaria patients, about thirty-eight percent participants found + for the parasites of malaria in the smear slides of blood. Out of + patients, four hundred and fifty-one patients discovered with the infection of *Plasmodium vivax* & eight hundred and sixty patients had the infection of *P. falciparum*. *P. falciparum* infection was very common in the district of Multan. We found no infection of *Plasmodium malariae* & *P. ovale* found in this research work.

Conclusion: The infection of the malaria is very common in district of Multan, which is one of the hot areas of Punjab, the province of Pakistan. In medically supposed patients of malaria, the observation of high slide rate of positivity occurred. The rate of prevalence of 65.5% of *P. falciparum* creates a serious danger to health because not *p. falciparum* but with *P. vivax* infection of 34.4% may cause the serious diseases as malaria of cerebral malaria. The high rate infection due to malaria should be a concern for the officials of program of malaria control in the country.

Key Words: Parasite, malaria, infection, patient, *P. falciparum*, *P. vivax*, common, prevalence.

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INTRODUCTION:

Half population of the world has the danger to acquire malaria & a supposed two hundred and forty-three million patients led to about 8.5 lakhs deaths in the year of 2008. In Mediterranean areas, Plasmodium falciparum is very common type of parasite in Djibouti, Sudan, Yemen & Saudi Arabia but most of the patients are in Pakistan & Afghanistan and all the patients in Iran & Iraq are because of Plasmodium vivax [1]. In 2006, in Pakistan, the surveillance program of malaria disease registered more than three million prepared slides & 127,825 patients with the confirmation of this disease with yearly occurrence of 0.8 patients per one thousand populations. But the real load of patients may be five times higher because facilities do not cover greater than twenty to thirty percent attending patients & remaining eighty percent get therapy from private organizations [2]. The amount of yearly malaria patients in Pakistan is 1.5 million [3]. In 2004, the rate of malaria was low in Punjab and Azad Jammu & Baluchistan and FATA concluded with high occurrence of malaria while Sindh and KPK provinces concluded with medium rates [4].

In the year of 2000, in Sindh, about six percent SPR (slide positivity rate) with sixty-five percent patients of *P. vivax* were available [5]. Falciparum malaria review has been documented [6]. There was a record of high occurrence of the falciparum in comparison with vivax among hundred patients at BMU (Baqai Medical University) [7]. In the year of 2006, about three percent SPR with fifty-eight percent *P. falciparum* & forty-two percent *P. vivax* were assessed [8]. Mahmood [9] researched three hundred and forty-eight patients with fever and assessed thirty-five percent SPR, with *P. falciparum* more than 88% & *P. vivax* as nine percent. Nizamani [10] concluded that 68,000 slides concluded as +for parasites of malaria in Sindh. More than three hundred blood samples were positive among two thousand in Karachi [11]. In south areas of Punjab, forty-one percent discovered infected by the species of Plasmodium [12]. In KPK, malaria of cerebral was more frequent in males [13]. Falciparum malaria is the main problem of health in the refugees of Afghanistan in KPK [14].

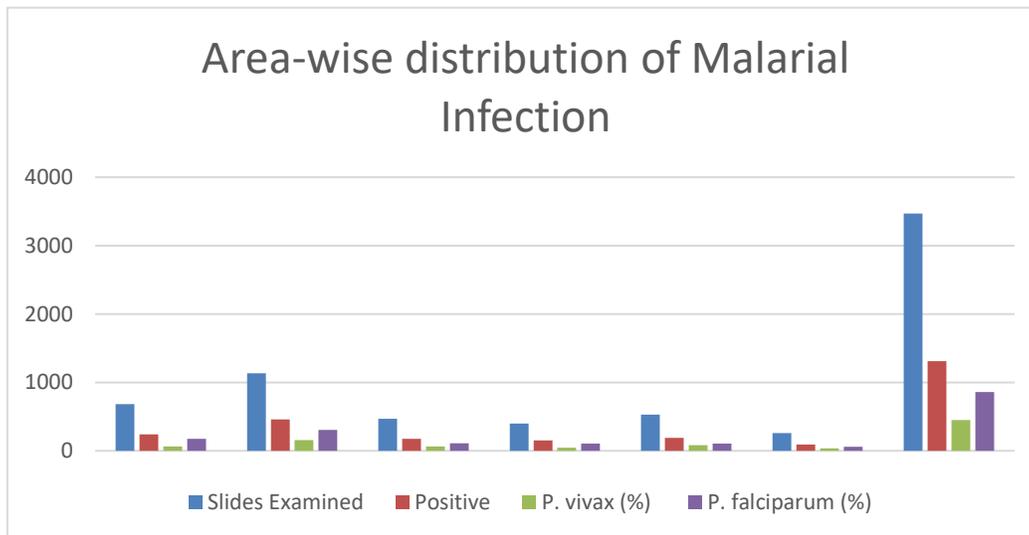
METHODOLOGY:

This research work carried out from July, 2016 to June, 2018 in Multan region to record the types of parasites of malaria from the samples of blood. Multan was the venue of this research work where the malaria patients were very common. There are two ways to detect this disease. These two methods are PCD (Passive Case Detection) [21] & ACD (active case detection) [21]. The discovery of the types of parasites of malaria was created by the keys provided by Paniker [21] and Chiodini [22]. Both PCD & ACD procedures were in use for the diagnosis of patients of malaria. In PCD, facilities of health have worked together. For ACD, twenty-four visits carried out during the period of two-year study. SPSS software version eleven was in use for the analysis of the data. Frequency & percentages were in use for the description of the information. Chi square test was in use to find out the relationship between the type of infection and the age of the patient. P value of less than .05 was considered as significant.

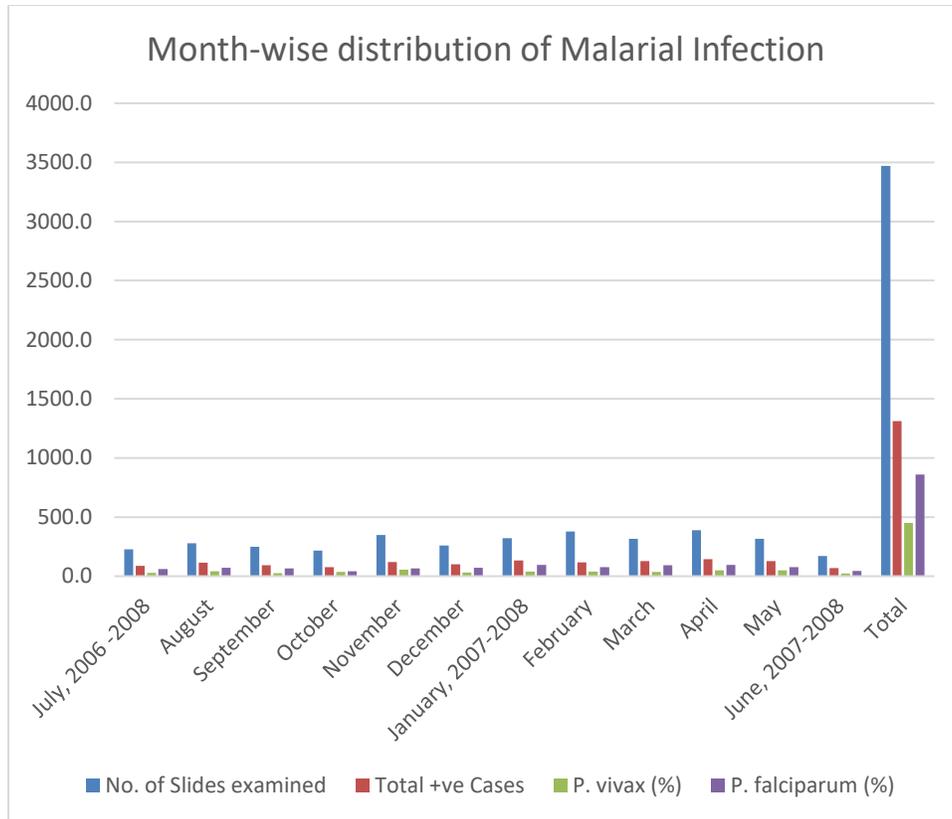
RESULTS:

Out of three thousand four hundred and seventy-one thousand smears of blood prepared from the patients from one to twenty-one year of age and above in six different regions of as mentioned in Table-1. There were different variations among various regions due to different surroundings and health conditions. In Multan region (Table-1), the overall occurrence of slides positivity of plasmodium was occurred in about thirty-eight percent, whereas *P. falciparum* was available with high occurrence of 65.5% in comparison with *P. vivax* as 34.4%. The most common type of the parasite of malaria was *P. falciparum* as shown in Figure. -1. *P. vivax* (Figure-2) was present in this research work with fewer occurrences of 35.4% in the patients from eleven to twenty year of age and 34.5% in the patients with age of twenty-one years and above. Table-2 Multan regions analysis carried out statistically to find out the association among the infection kind & the group of age through X² at five percent significance level, X² measured. The outcome shows that the kind of infection can occur in any age group of the patients.

Area	Slides Examined	Positive	P. vivax (%)	P. falciparum (%)
Multan (City)	681	239	64.0 (26.70)	175.0 (73.20)
Vihari	1135	459	155.0 (33.70)	304.0 (66.20)
Qadirpur Ran	469	176	66.0 (37.50)	110.0 (62.50)
Shujabad	398	153	47.0 (30.70)	106.0 (69.20)
Sahiwal	531	191	84.0 (43.90)	107.0 (56.00)
Basit Maluk	257	93	35.0 (37.60)	58.0 (62.30)
Total	3471	1311	451.0 (34.40)	860.0 (65.50)



Month	No. of Slides examined	Total +ve Cases	P. vivax (%)	P. falciparum (%)
July, 2016-2018	227.0	88.0	27.0 (30.60)	61.0 (60.30)
August	279.0	113.0	41.0 (36.20)	72.0 (63.70)
September	248.0	92.0	25.0 (27.10)	67.0 (72.80)
October	217.0	78.0	37.0 (47.40)	41.0 (52.50)
November	349.0	121.0	55.0 (45.40)	66.0 (54.50)
December	261.0	102.0	30.0 (29.40)	72.0 (70.50)
January, 2007-2008	321.0	134.0	38.0 (28.30)	96.0 (71.60)
February	377.0	116.0	40.0 (34.40)	76.0 (65.50)
March	317.0	128.0	36.0 (28.10)	92.0 (71.80)
April	389.0	144.0	49.0 (34.00)	95.0 (65.90)
May	316.0	127.0	49.0 (38.50)	78.0 (61.40)
June, 2007-2008	170.0	68.0	24.0 (35.20)	44.0 (64.70)
Total	3471.0	1311.0	451.0 (34.40)	860.0 (65.50)



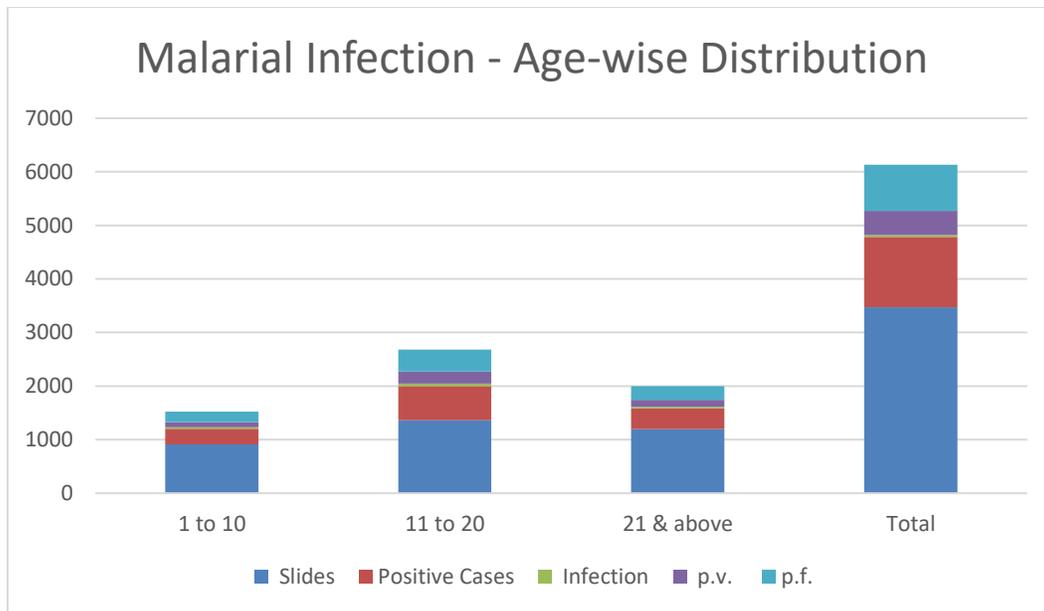
DISCUSSION:

High rate of the Plasmodium falciparum (more than sixty-five percent) concluded in this research work creates dangerous condition in Multan as same types were present in Loralai Musa Khel [23], Sanjavi [24] (eighty-four percent), BMU Karachi [7] (sixty-five percent) and Jahangara [5] (sixty-five percent). High mortality is the result of malaria caused by Falciparum [6]. At the time of this research work in district of Multan, high frequency of slide positivity (thirty right percent) concluded in the children of living in the areas as high SPR (of more than ninety-six percent in the children living in the areas of

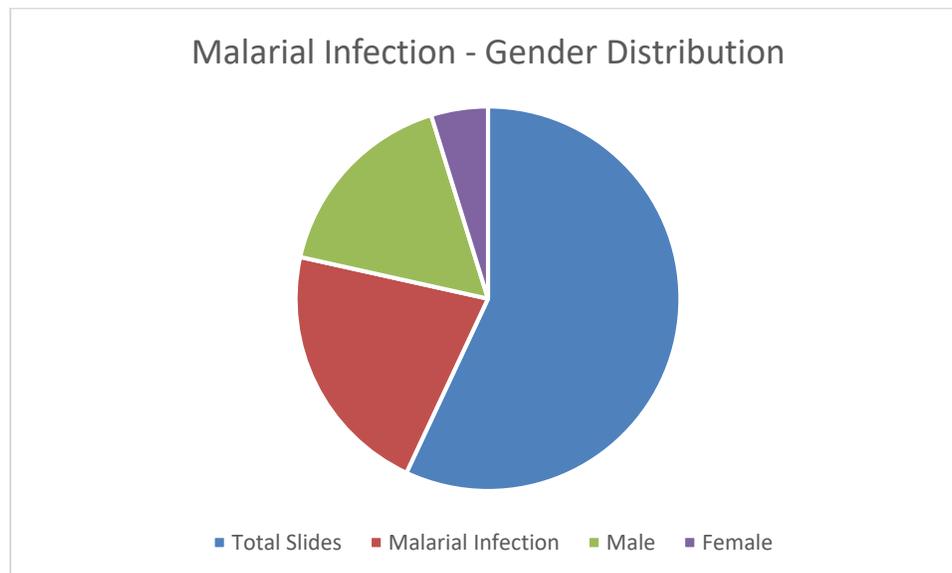
Mansehra [25] than to less SPR as twenty-four percent in Sindh [10] & 7.2% at a teaching hospital located in Abbottabad [26]. But combine infection of P. vivax & P. falciparum was not available in the patients suffering with malaria in Multan & also not present in Loralai Musakhel [23] but observed as 0.3% in the patients suffering with this disease in Sanjavi [24] & also in the patients from the areas of South Punjab [12]. In the areas of Multan (Table-3 & Table-4), the overall occurrence of positivity of the Plasmodium was 33.7% in which infection of P. falciparum was greater as 65.5% in comparison with P. vivax as 34.4%.

Table-III: Malarial Infection in District Multan - Age-Wise Distribution.

Age (Year)	Slides	Positive Cases	Infection (%)	p.v. (%)	p.f. (%)
1 to 10	911.0	291.0	31.90	93.0 (31.90)	198.0 (68.00)
11 to 20	1364.0	635.0	46.50	225.0 (35.40)	410.0 (64.50)
21 & above	1196.0	385.0	32.10	133.0 (34.50)	252.0 (65.40)
Total	3471.0	1311.0	37.70	451.0 (34.40)	860.0 (65.50)



Total Slides	Malarial Infection	Male	Female
3471.0	1311.0	1020.0 (77.80%)	291.0 (22.10%)



Among children with plasmodium slide positivity with age of one to ten years about sixty-eight percent were present to be + for *P. falciparum* & about thirty-two percents with for *P. vivax*. The very common type of the parasite of malaria was *P. falciparum* (Figure-1) with greatest occurrence of 65.4% in the

patients with twenty-one years and above, 64.5% in the patients of eleven to twenty year of age. But *P. vivax* was present with low ratio of occurrence of 35.4%, 34.5% in the patients of eleven to twenty year of age and twenty-one and above respectively. In the districts of Loralai Musakhel, out of 7899 supposed

patients, twenty-nine percent patients were with + smear with 71.8% of Plasmodium falciparum & 28.2% of Plasmodium vivax [23]. In this research work, no patient with the infection of P. malaria & P. ovale was available.

CONCLUSIONS:

In this research work, the rate of occurrence of 65.5% of Plasmodium falciparum creates a danger on health due to the serious complications created by these parasites. We concluded that the occurrence of the infections due to P. falciparum were very common in Multan.

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