



PREVALENCE OF MALARIA IN FLOOD AFFECTED AREAS OF TALUKA MEHRABPUR, SINDH, PAKISTAN

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Abstract

Aims & Objectives: The objective of the study was to see the prevalence of malaria and type of malarial parasite in flood affected areas of taluka Mehrabpur.

Methodology: A cross sectional observational study was conducted from July 2022 to 9th September 2022 in flood affected areas of taluka Mehrabpur. Patients with malaria-like symptoms underwent malaria testing. A consultant pathologist used the Malaria P.f. /P.v. Rapid Test kit, product number cassette: RAPG-MLR-004, to perform a malarial test. The statistical analysis of the data was conducted using the SPSS 24 version software.

Results: The results display the demographic information of the study participants as well as the prevalence of malaria in the flood-affected areas of Taluka Mehrabpur. The study participants were divided into groups according to age, gender, and locality, as well as type, to determine the prevalence of a particular plasmodium type in a given age, sex, and locality. Patients were divided into nine age groups; most were between the ages of 11 and 20, with only one patient between the ages of 71 and 80. Of the 1250 patients tested for malaria, 1037 of them tested positive for the disease, and 213 of them tested negative; of these, the majority, 937, were afflicted with Plasmodium vivax, while only 100 had plasmodium falciparum.

Conclusion: According to the study findings 1037 patients out of 1250 individuals tested positive for malaria. of the 1037 research participants, 937 had plasmodium vivax infection, and 100 had plasmodium falciperum infection. No instances of plasmodium falciperum were found in transgender individuals.

Key Words: Malaria, Plasmodium Vivax, Plasmodium Falciperum.

Background

Malaria presents as an acute febrile infection induced by Plasmodium parasites, transmitted to humans through the bite of infected female Anopheles mosquitoes. The Plasmodium genus comprises five distinct species [1,2]. Among these, Plasmodium falciparum and Plasmodium vivax stand out as the most prevalent and perilous contributors to human malaria. Recognizing the early symptoms of malaria, such as low temperature, headache, and chills, can be challenging. Typically, these symptoms become apparent ten to fifteen days following the bite of an infected mosquito. It is crucial to note that P. falciparum malaria, if not promptly and appropriately treated, can rapidly escalate, posing a life-threatening risk and potentially leading to fatal outcomes within twenty-four hours [3]. Pregnant women, children in school, toddlers, and those with low immunity—as well as those living with HIV/AIDS—are also more vulnerable. According to the most recent World Malaria Report, 227 million cases of malaria were recorded in 2019, and 241 million cases were reported in 2020 [4,5]. A WHO report states that 32 sub-Saharan African nations account for 93% of malaria-related deaths worldwide, with over 2000 South African children dying from the disease each year. WHO According to reports from the African continent, malaria continues to have a heavy burden there; in 2020, 95% of illnesses were malarial, and 96% of malaria-related deaths occurred [6]

Owing to Pakistan's high malaria rate, scientists frequently assess the frequency of the causing disease in various cities and regions around the nation. In a study on the prevalence of Plasmodium in Multan, Punjab, Yar et al. found that 61.3% of cases were Plasmodium [7]. The most common health problem among the people in Baluchistan, according to Durrani et al.'s malaria studies, is cerebral malaria. His findings showed that 36.39% of adults and 63.61% of children had malaria [8]. P. falciparum infections in children were shown to be more common (64.56%) in Karachi, Sindh, than P. vivax infections (35.44%). Mohammad and Hussain's research in Quetta, Baluchistan, between 1991 and 1995 found that the prevalence of malaria infection had increased from 22.12% to 44.44% [9]. The highest infection rate in district Bunir was recorded in the month of August (11.61%), while the lowest infection rate was recorded in the month of March (3.9%) [10]. 200 paediatric cases were examined by Jamal et al. in Attock, and they found that P. vivax infection was higher (62.6%) than P. falciparum infection (37.4%) [11]. Nizamani et al. reported that 2.42% of individuals in certain Sindhi districts were afflicted with malaria [12]. In their study of malaria, Uttra et al. discovered a 52.4% prevalence of P. vivax and a 47.6% prevalence of P. falciparum in the locality [13]. Junejo et al. (2008) investigated samples obtained from people suffering from malaria at Larkana. He reported 41% for P. vivax and 59% for P. falciparum [14]. Malaria, which affects half of the world's population, including those in Pakistan, is the most frequent disease. The World Health Organization states that scientific evidence has proven that distinct Plasmodium species are the cause of malaria. They can cause a variety of symptoms and signs, and they can occasionally be fatal. Malaria claims the lives of more than a million people annually [1].

Mehrabpur is a highly populated taluka of district Naushahro feroze, Sindh. It is situated on the Indus River's right bank. It has a changeable climate with scorching summers and frigid winters.

Mehrabpur's maximum recorded temperature falls between 45 and 50 degrees Celsius. The large number of mosquitoes that are frequently present here. Malaria can occur in people if they are bitten by an infected female Anopheles. Due to continuous heavy rain from June 2022 till 26th September 2022, flood came from various canals due to their overcapacity as well as accumulation of sewerage water, has increased the number of mosquitoes, as a result chances of malarial infections increased. Therefore, the present study was conducted to measure the prevalence of malaria throughout taluka Mehrabpur especially in flood affected areas. This study will help in the management and planning efforts to eradicate malaria and lessen its consequences.

Methodology

A cross sectional observational study was conducted from July 2022 to 9th September 2022 in flood affected areas of taluka Mehrabpur. The study was conducted on 1250 patients after taking informed consent. Male, female and transgender were included in the study. All age groups were included in the study. Patients having symptoms like malaria were tested for malaria. Malarial Test was performed by consultant pathologist by using Malaria P.f /P.v Rapid Test kit having product number cassette: RAPG-MLR-004. The data was statistically evaluated by using SPSS 24 version software.

Results

Table 1 shows demographic data of study subjects as well as prevalence of malaria in flood affected areas of taluka Mehrabpur. The study participants were systematically classified based on age, gender, locality, and the specific type of Plasmodium to assess the prevalence within distinct age groups, gender categories, geographical areas, and variations in Plasmodium species. Patients were categorized into nine age groups: out of 1250, 827 patients were male, and only 22 patients were transgender. Of the study subjects, 76.4% were from rural areas and 23.6% were from urban areas. Of the 1250 patients tested for malaria, 1037 patients had positive results and 213 patients had negative results. Of the 1037 patients, the majority (937) had plasmodium vivax, while only 100 patients had plasmodium falciparum.

Table 1: Demographic data & prevalence of malaria

Name of variable	Frequency	Percentage
Age in years		
1-10	631	50.5
11-20	222	17.8
21-30	117	9.4
31-40	66	5.3
41-50	145	11.6
51-60	19	1.5
61-70	31	2.5
71-80	01	0.008
81-90	12	10
91-100	06	5
Gender		
Male	827	66.2
Female	401	32.1
Transgender	22	1.8
Locality		
Rural	955	76.4
Urban	295	23.6
Malarial parasite		
Positive	1037	83
Negative	213	17

Type of malarial parasite		
Vivax	937	75
Falciperum	100	17

Cross tabulation of Age in Years versus Malarial Parasite

Table 2 shows cross tabulation of age of study subjects versus malarial parasite, among malarial positive study subjects. It was observed that the majority of malaria was seen in children with age group from 1-10 years whereas no case of malaria was seen in the age group 71-80 years.

Table 2 Cross tabulation of Age versus Malaria
Count

Age in Years		Malarial Parasite		Total
		Positive	Negative	
Age in Years	1-10 Years	538	93	631
	11-20 Years	153	69	222
	21-30 Years	99	18	117
	31-40 Years	53	13	66
	41-50 Years	144	1	145
	51-60 Years	12	7	19
	61-70 Years	24	7	31
	71-80 Years	0	1	1
	81-90 Years	12	0	12
	91-100 Years	3	3	6
Total		1038	212	1250

Gender * Type of Malarial Parasite Crosstabulation

Table 3 presents a cross-tabulation of the gender of research participants with the kind of malarial parasite to determine which form of malarial parasite affect men more frequently than other genders. Surprisingly, no cases of malarial parasites were found in transsexual people.

Table 3. Gender versus type of Malarial parasite
Count

Gender		Type of Malarial Parasite		Total
		Plasmodium Falciperum	Plasmodium Vivax	
Gender	Male	62	645	707
	Female	38	277	315
	Transgender	0	15	15
Total		100	937	1037

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.338 ^a	2	.114
Likelihood Ratio	5.656	2	.059
Linear-by-Linear Association	.986	1	.321
N of Valid Cases	1037		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.45.

Discussion

Malaria is an acute fever infection caused by Plasmodium parasites with five distinct types, transferred to human beings through the bite of infected mosquitoes called female Anopheles mosquito [1,2]. Latest World Malaria Report says that, in 2019 there were 227 million cases of

malaria while in 2020 malarial cases increased up to 241 million. In 2020, a cross-sectional study was carried out in Pakistan's KPK province to determine the prevalence of malaria throughout the province. It was found that the poor quality of healthcare in three districts' hospitals contributed to the high malaria prevalence in those districts. Comparable to our study, which found that 83% of all tested patients had a high prevalence of malaria due to unsanitary surroundings, severe rain, and flooding.

Another study, which was published in PLOS Neglected Tropical Diseases, looked at the prevalence of clinical malaria and patient household characteristics in Pakistan's tribal areas. They tested 1127 suspected malaria patients, and 78% of them tested positive for the disease [15]. This is comparable to the current study, which found that 83% of patients tested positive for the disease, but the majority of the patients in the current study also had plasmodium vivax as their primary cause of infection.

A survey-based study was conducted in 2013 in the journal of malaria to investigate the prevalence and distribution of human plasmodium infection in Pakistan. In this study they tested 801 patients from all over Pakistan, and found that majority of the study subjects were infected by plasmodium vivax whereas no any case of plasmodium ovale or malariae was reported. This aligns with the current study, where the majority of patients were infected by plasmodium vivax. but in current study transgenders were also included. All transsexual participants in the current study had plasmodium vivax infections; none had plasmodium falciperum infections.

Conclusion

According to the study's findings Taluka Mehrabpur's flood-affected areas had a high malaria prevalence. Out of all the patients who were tested, 83% had malaria. All transgenders of flood affected areas of taluka Mehrabpur were also included in the study. Majority of the patients 937 out of 1250 were infected with plasmodium vivax only 100 patients were infected with plasmodium falciperum. 277 of the 315 females had P. vivax infection, while 38 had P. falciperum infection. Twenty-two transgender people in all were tested for malaria: of those, fifteen tested positive. No transgender person had a p. falciperum infection, whereas all transgender people had p. vivax infections.

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