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Prevalence and Occurrence of Malaria among Human Populations of District Hyderabad Sindh, Pakistan

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Abstract

Around the world, malaria is a major health worry in many developing countries such as Pakistan. The purpose of this study design was to find the percentage of cases of malaria among people living in District Hyderabad, Sindh, Pakistan. During the period from 1 January to 30 June, 2024, a descriptive study was carried out. We gathered the data from the different hospital of District Hyderabad, Sindh, Pakistan. The statistical work in this paper was done using MS Excel 2016. In all, 93029 people with suspected malaria were registered. Approximately 56.74% of all positives in these totals were males and 43.25% were females. Of the total positive cases (92.55%), Plasmodium vivax was identified, with Plasmodium falciparum accounting for (6.9%) of the remaining cases. According to age groups, 59.41 percent of cases were reported in people 15 years or older. More than a quarter of the cases were reported in May which was the highest and just a tenth in February which had the lowest number. Overall, the data showed that men were more likely to be infected, with the most cases seen in people ages 15 and older. In District Hyderabad, P. vivax is the main species.

Introduction

The disease malaria is spread by mosquitoes and is caused by the protozoan parasites Plasmodium. It puts people all over the world at risk. Malaria is mainly caused by Plasmodium falciparum and Plasmodium vivax which infect most of the world's population. P. vivax malaria is recognised as benign tertian malaria. It is sometimes mistaken for something harmless, probably because it often shows up as a short, severe illness. Individuals infected with P. vivax malaria experience hot flashes, cold chills, head and muscle pain, tiredness and fatigue (Mistry and Panchal, 2020).

Each of the four types of human malaria parasite belongs to a protozoan genus named haemosporidiidea and is carried from person to person by the bites of female anopheles' mosquitoes. Researchers have reviewed the pathway by which P. falciparum causes the common and serious problems seen in P. falciparum malaria such as high levels of lactate, metabolic acidosis, low blood sugar, problems with breathing, loss of consciousness and haemoglobin reduction (Whiteoak, 2015).

Malaria is still a major health issue facing Pakistan. Malaria caused more than 2.6 million cases in Malaysia in 2008 and it claimed the lives of about 50,000 each year. There were almost one million malaria cases confirmed by microscopy in the Eastern Mediterranean region in 2010, with 22% of those from Pakistan. Figuring out how common Plasmodium infection is in Pakistan has been challenging,

since the number and types of malaria parasites in various areas are not fully known (Khan *et al.*, 2023).

Malaria is a frequent disease in Pakistan. There is not enough epidemiological evidence from each region of Pakistan to accurately measure the different kinds of malaria. The city Hyderabad lies on the river Indus' right bank and has a hot climate in the Sindh of Pakistan. Both ponds and insufficient drainage allow mosquitoes to breed. It is commonly difficult for doctors to identify a cause for fever, especially since quick response is needed. Even if malaria is the main reason for fever cases, it is common here for enteric fever and tuberculosis to also be found (Khan *et al.*, 2023).

Climates in Pakistan are either tropical or temperate and while the southern coast is dry, the land goes from near sea level to higher than 9,000 meters. Plasmodium vivax accounts for around 64% of cases and Plasmodium falciparum for about 36%, in Pakistan; malaria is generally located in Khyber Pakhtunkhwa, Baluchistan, Sindh and the Federally Administered Tribal Areas. The spread of malaria varies, with large outbreaks of P. vivax occurring June to September and again from April to June, as these infections reoccur in people in the following season. P. falciparum is most commonly transmitted in Pakistan during the period from August to December (Kumar *et al.*, 2020).

If we reduce malaria, we can also lower the rates of death and sickness related to it. You can prevent mosquito bites through using the right measures to control your environment and by using proper bed nets, clothing, insect repellents and insecticides. Chemoprophylaxis plays a key role in preventing malaria and new, strong medicines are becoming available. If you get malaria despite keeping safe, quick and accurate diagnosis and proper treatment will be helpful (Ullah *et al.*, 2024).

Mild malaria can be treated with drugs you swallow. Artemisinins are used to treat Plasmodium falciparum infection because they lessen the parasite's ability to develop resistance to one component of the drug. According to the WHO, pregnant women diagnosed with malaria should take quinine along with clindamycin when they are in their first trimester. Treatment for infections caused by Plasmodium vivax, Plasmodium ovale or Plasmodium malariae is usually carried out as an outpatient (Egwu *et al.*, 2023).

Malaria in Pakistan is usually transmitted following July and August's seasonal monsoons. The main approach to controlling malaria is with anti-malarial drugs. Despite the effective programs against malaria, more than fifty thousand people still die each year. Using medicines against malaria, removing mosquitoes from wherever you are and avoiding mosquito bites are among the strategies to stop malaria. How quickly the infection spreads are connected to the total number of humans and anopheles' mosquitoes living together.

Materials and Methods

Study Design: A descriptive study was designed form 1st January to 30 June 2024.

Data Collection: Data of the suspected malarial patients were collected from different hospitals of District Hyderabad, Sindh, and Pakiatan

Prevalence Rate: Prevalence was calculated with the help of following formula.

$$\textbf{Prevalence rate} = \frac{\text{No.of Patient's having Malaria}}{\text{Total No.of Patient's diagnose}} \times 100$$

Rapid Diagnostic Test(RDT)

Rapid diagnostic tests (RDTs serve as a valuable tool for the detection of malaria parasites in blood samples, facilitating confirmation of malaria diagnosis. In scenarios where high quality microscopy services are unavailable, RDTs can effectively supplement clinical assessments or replace microscopy-based diagnoses. These tests provide timely results, enabling prompt clinical decision-making in the management of malaria cases.

Ethical Consideration: The current study was approved by the ethical research committee Advanced Studies and Research Board of GC University Sindh Pakistan.
Statistical Analysis: For statistical analysis MS Excel version 2016 was used.

Results

In our study a total of 93029 suspected cases of malaria were positive comprises male to female ratio was 5239 (56.74%) and 3994 (43.25%) respectively. Our result shows that P. vivax was the most dominant malaria parasite 8546 (92.55%) while P. falciparum was found 638 (6.9%) shown in table 1. On the basis of age groups high No. of cases 5486 (59.41%) was recorded in age 15 & Above years. followed by 2975 (32.22%) in age between 5-14 years, and 772 (8.36%) in age between 0-4 years are described in table 2.

Table 1: Prevalence of malaria collected from Different hospital of District Hyderabad, Sindh, Pakistan (1 January-30 June 2024)

Months	Total	Positive	Male	Female	P. vivax	P. falciparum	Mix species
January	13643	1,173	644	529	955	203	15
February	13164	763	423	340	697	63	3
March	13987	841	460	381	776	41	24
April	15906	1414	829	585	1373	39	2
May	19764	2667	1508	1159	2468	196	3
June	16565	2375	1375	1000	2277	96	2
Total	93,029	9233 (9.92%)	5239 (56.74%)	3994 (43.25%)	8546 (92.55%)	638 (6.9%)	49 (0.5%)

Table 2: Age wise distribution of malaria patients

Age group (Years)	Positive cases	Negative cases
0-4	772	6578
5-14	2975	70364
15 &Above	5486	6854

Discussion

We intend to build up what is already understood about malaria cases in District Hyderabad, Sindh Pakistan. The result of our study is that 9.92% of individual's report having a sleep disorder, compared to a higher percentage in previous research. Malaria influenced 10.29% of individuals at Lal Qilla, as found by the researchers Hussain *et al.* in 2015. Among the samples studied in Tertiary Hospital Karachi Pakistan in 2015, Yaseen and Ali discovered (18%) that carried malaria parasites. Hussain and his team found that 29% of the population was affected with malaria (Hussain *et al*.2014). We found that P. vivax is more common than P. falciparum in the area where we analyzed malaria. In the study we did not see any P. ovale, P. malariae or mixed infections. Our findings agree with other studies showing that P. vivax was common (Majid *et al.*, 2016).

There is not enough data from different areas of Pakistan to precisely judge the prevalence of malaria. What we discover in our study will help build up a better picture of this disease's epidemiology (Abbas *et al.*, 2024).

We believe there are several reasons why males were more common in our study. Being outside and active during the day puts men at risk for being bitten by mosquitoes carrying infection. Also, males have less trouble getting access to healthcare because cultural norms restrict female health care.

Conclusion

There are more male cases than female cases and the high number of cases occurs in those over age 15. In District Hyderabad, Sindh, Pakistan the majority of cases are brought on by P. vivax. Social marketing holds promise for supplying new ways to control and prevent malaria. In policies against smoking to succeed, an accurate view of related factors is needed.

Being able to own and to practice is very important. Hyderabad Local government should pay attention to the malaria problem. A lot of people suffered in April, May and June, making the impact on individuals higher the main support for the country. It is necessary to take practical steps to meet the requirements needed to handle spreading mosquitoes and also improve cleanliness in order to end the problem in District Hyderabad, Sindh, Pakistan.

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