Prevalence of Thrombocytopenia in People with Malaria

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Abstract

Background: One of the most common issues that causes high morbidity and mortality worldwide is malaria. Malaria is a vector-borne disease. Malaria's transmission is done by female anopheles. The World Health Organization reported that 7.8 million people every year die because of malaria. Every year, more than 225 million people globally are affected due to malaria. Pakistan has a high prevalence of malaria, a major public health concern. Malaria is diagnosed by examining blood smears stained with Giemsa under a microscope. Malaria caused by the Plasmodium vivax parasite is more common and affects a broader population than Plasmodium falciparum malaria.Objective: To determine the prevalence of thrombocytopenia in malaria patients at a tertiary care hospital.Study design: A cross-sectional studyPlace and Duration This study was conducted in People's University of Medical and Health Sciences for Women Nawabshah from May 2022 to May 2023 Methodology: A total of 200 participants were selected for this research through the WHO sample size calculator. All the patients included in this research were diagnosed with malaria. The ages of all of the participants ranged from 18 to 60 years old. Every participant's medical history and information related to demographics was collected through a pre-designed proforma. People who tested positive for malaria underwent clinical examinations.Results: There were a total of 200 peoples enrolled in this research. A total of 110 males and 90 females were included in this research. The average age calculated was 26 years. The majority of the patients were in the age range of 18 to 30 years. The frequency of thrombocytopenia against malaria was 180 (90%). Conclusion: In conclusion, thrombocytopenia is the most prevalent in those people who are diagnosed with malaria.

Keywords: Malaria, adults, prevalence, thrombocytopenia

1. Introduction

One of the most common issues that causes high morbidity and mortality rates worldwide is known to be malaria [1]. Malaria is a vector-borne disease. Female anopheles are responsible for malaria transmission [2]. The World Health Organization reported that 7.8 million people every year die because of malaria [3]. Every year, more than 225 million people globally are affected due to malaria [4]. Malaria posed a threat to around 3.3 billion people globally in 2011. According to projections, there would be approximately 219 million illnesses and 660,000 deaths, with Africa bearing the brunt of the burden, accounting for 80% of cases and 90% of fatalities [5]. Malaria is a major public health hazard in tropical and subtropical regions around the world. The majority of Pakistanis reside in rural areas, just like in tropical and subtropical countries where malaria is prevalent. In Pakistan, the months of July and August are the most vulnerable to malaria [6]. While malaria is more evenly distributed in Khyber Pakhtunkhwa and Sindh, it is more prevalent in Balochistan and the federally administered tribal

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territories. In Pakistan, malaria is endemic in 91 (86.7%) districts (86.7%) [7].

Pakistan has a high malaria prevalence, which is a major public health concern. Malaria is diagnosed by examining blood smears stained with Giemsa under a microscope. The benefit of a thin smear is its capacity to distinguish between different species, which is important given the various treatments for different species [8]. Rapid diagnostic tests (RDTs) for malaria, which require less training, are increasingly being used for regular malaria testing. Plasmodium vivax-caused malaria is more prevalent and affects a larger population [9]. When compared to the other four species, Plasmodium falciparum has the highest rates of morbidity and mortality, as well as a high degree of parasitemia [10].

Malaria patients frequently develop hematological abnormalities such as anemia, thrombocytopenia, and leukopenia [11]. Thrombocytopenia is well recognized as a significant indication of malaria, and this is backed by numerous research. Kochar and colleagues observed thrombocytopenia in 24.6% of malaria-infected patients [12]. Although the precise pathogenic pathway between malaria and thrombocytopenia has been thoroughly studied, it remains unknown. Thrombocytopenia in malaria patients is caused by a number of factors, including increased bleeding, increased platelet activity, and apoptosis. Furthermore, malarial antigens produce immune complexes that phagocytose and destroy the damaged platelets. The current study is planned to determine the prevalence of thrombocytopenia in malaria patients at a tertiary care hospital.

2. Methodology

There were a total of 200 participants selected for this research through the WHO sample size calculator. All the patients included in this research were diagnosed with malaria. The ages of all of the participants ranged from 18 to 60. All of the participants were present at the hospital. The Ethical Review Committee of the hospital approved this research. Every patient involved in this research was informed about the research, and their written consent was obtained. Every participant's medical history and information related to demographics were collected through a pre-designed proforma. People who tested positive for malaria underwent clinical examinations. SPSS version 22 was used to analyze the collected data. The mean and standard deviation were used to express the quantitative variables. Frequency and percentages were used to express the qualitative variables.

Exclusion criteria

People who were negative for malaria on peripheral blood film were not a part of this research. Moreover, patients with cancer, acute viral febrile illness, systemic lupus erythematosus, co-existing bacterial infections, dengue fever, bleeding disorders, chronic liver problems, sepsis, disseminated intravascular coagulation, idiopathic thrombocytopenic purpura, viral hepatitis, and history of antimalarial drug intake were not included in this research.

3. Results

There were a total of 200 people enrolled in this research. There were a total of 110 males and 90 females. The average age calculated was 26 years. Table 1 shows the distribution of patients according to their ages.

Table No. 1: distribution of patients according to their ages.	
Age Group (Years)	N
18 to 30	104
31 to 40	42
41 to 50	30
51 to 60	24

Table number 2 shows the distribution of participants based on the type of malaria.

Table No. 2: distribution of participants based on the type of malaria	
Type of malaria	N
Plasmodium Vivax Malaria	180
Plasmodium Falciparum Malaria	20

The frequency of thrombocytopenia in malaria was 180 (90%). Table number 3 shows the distribution of patients based on grades of thrombocytopenia.

Table No. 3: distribution of patients based on grades of thrombocytopenia.	
Grades of thrombocytopenia	N
Grade 1	100
Grade 2	50
Grade 3	30
Grade 4	20

4. Discussion

In Pakistan, both P. vivax and P. falciparum are common causes of malaria [11]. Malaria is a serious blood illness that affects practically all blood elements. Anemia and thrombocytopenia are two common hematological problems associated with malaria. Malaria has been identified as the principal cause of low platelet counts in malaria-endemic areas [12]. Because of its strong link to malaria, this decrease in platelet count is widely used as a diagnostic sign for patients presenting with fever. When the platelet count goes below 1, 50,000/cmm, in febrile illness, the risk of having malaria increases 12–15 times.

The purpose of this study was to determine the prevalence of thrombocytopenia among malaria patients treated at a tertiary care hospital. The study included 200 people, 55% of whom were men and 45% of whom were women. Only 10% of the 200 cases tested positive for Plasmodium falciparum malaria, while 90% tested positive for Plasmodium vivax malaria. It is worth noting that Plasmodium vivax malaria is more common and affects a larger

population than Plasmodium falciparum malaria in several parts of the world [13, 14].

A recent study done by MUHAMMAD ASIF and colleagues found that P. vivax malaria was more common in Pakistan than P. Falciparum [15]. Similarly, Hamza Ali Khan and colleagues observed that P.vivax malaria was detected in 92.7% of patients, while p. falciparum malaria was found in just 7.3% of patients [16]. In our current investigation, thrombocytopenia was detected in 90% of the 200 malaria-infected patients (n = 180). Previous studies have revealed that between 60% and 80% of malaria patients develop thrombocytopenia. Research by Patel and colleagues found that thrombocytopenia was present in 93.6% of malaria patients, which is consistent with our findings [17].

A different study found thrombocytopenia in 80% of their malaria patients, which was similar to the findings of this study [18]. Our research mostly focused on P.vivax malaria patients. A Brazilian study found that thrombocytopenia was more common in P.vivax cases than in P. falciparum cases [19]. In contrast, a previous study found that P. falciparum patients had a higher rate of thrombocytopenia than P.vivax patients [20]. Overall, 50% of the patients with thrombocytopenia had grade 1 thrombocytopenia, 25% had grade 2, 15% had grade 3, and 10% had grade 4 thrombocytopenia. Surprisingly, another study found nearly identical results to ours.

It is believed that oxidative stress-induced platelet damage contributes to the development of malaria. Identifying thrombocytopenia in acute febrile patients and considering malaria as a main differential diagnosis would help these patients be treated as soon as possible.

5. Conclusion

In conclusion, thrombocytopenia is the most prevalent in those who are diagnosed with malaria.

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This study was conducted without receiving financial support from any external source.

Conflict in the interest

The authors had no conflicts related to the interest in the execution of this study.

Permission

Prior to initiating the study, approval from the ethical committee was obtained to ensure adherence to ethical standards and guidelines.

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