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EVALUATION OF MALARIA ON HEMATOLOGICAL BASIS

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Abstract:
Objective: *To see the effect of malaria on platelet count and hemoglobin in adults with malaria.*
Study Design: *A descriptive study.*
Place and Duration: *In the Medicine department of Nishtar Hospital Multan for one year duration from March 2019 to March 2020.*
Methodology: *The study included adult patients admitted with a fever of less than seven days who had a positive malaria parasite swab. After a detailed history and thorough examination, patients were examined to determine the cause of the fever. All patients with localized cause of fever and history of drug (anti-malarial) treatment were excluded. All patients were examined with complete blood counts and serial peripheral smears for malarial parasite. A peripheral blood smear test for malarial parasite was considered the gold standard in the diagnosis of malaria. The cut-off value for low hemoglobin (anemia) was taken as 10 gm / dl, and platelets below 150 x 109 / l were used to define thrombocytopenia. Thrombocytopenia patients were divided into three categories. Mild thrombocytopenia was defined as patients with platelet counts <50 x 10.9 / L to> 150 x 109 / L, moderate thrombocytopenia included patients with platelet counts <20 x 109 / L to> 50 x 109 / L.*
Results: *Tested in a total of one hundred patients with positive smear, of which 91% had low and 9% normal platelet counts. 95% had Vivax and only 5% had Falciparum malaria. The mean platelet count was 93x1 09 / L. The mean platelet count in Falciparum was 54 x 110 / L, whereas in malaria vivax it was 98 x 10 s / L. Sixty-eight (68%) patients had anemia. The average hemoglobin was 9.20 g / d1. The mean hemoglobin concentration in Falciparum malaria was 8.00 gm / dl, whereas in Vivax - 9.40 g / dl.* ***Conclusions:*** *A higher incidence of mild to moderate thrombocytopenia and anemia was observed in hospitalized adults with malaria.*
Key words: *adults, malaria, thrombocytopenia, anemia.*

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INTRODUCTION:

Malaria is a global disease and a heavy burden on public health. There are about 250 million cases a year and about a million deaths associated with this disease[1-2]. Plasmodium Falciparum was one of the main causes of death[3-4]. It is increasingly observed that high mortality and widespread malaria are one of the main indicators of the gradual evolution of malaria as a complex health problem. Detailed analysis of hematological profiles provides one of the most well-known clinical studies of strongly positive selection in our population. We deepen our concepts regarding the massive amounts of Plasmodium falciparum and vivax in patients with blood malaria, erythrocyte elimination, endothelial activation and microvascular inflammation[5-6]. Devastating Pathological Effects on Host Tissues and Organs Evidence has shed light on the genotyping of common species in Pakistan, and better research is being used using technological and computer advances to identify genetic loci selected in the malaria parasite[7-8]. Rapid collection of statistical information provides important evidence that malaria is a constant problem in Pakistan. It has also been convincingly observed that P. vivax co-infection with P. falciparum is often observed in endemic malaria regions in Iran and Pakistan[9].

METHODOLOGY:

This study was held in the Medicine department of Nishtar Hospital Multan for one year duration from March 2019 to March 2020. Adult patients with fever less than seven days were selected for the study, together with a positive malarial swab. A comprehensive history and study was conducted to rule out any other cause of fever. Patients with some local disease as the cause of fever and patients with signs and symptoms of chronic liver disease, a history of bleeding disorders, thrombocytopenia or purpura were included in the exclusion criteria. Similarly, patients who took sulfonamide, chemotherapy and some forms of anti-malarial drugs were also not included in this study. All selected patients underwent a serial peripheral smear for the malaria parasite after admission and with high fever and complete blood count. Thick and thin smears were stained with Leishman stain and examined. A full chest X-ray, blood culture, Salmonella serology and complete urine test were performed to rule out other causes of the disease, as well as serum chemistry (electrolytes, urea, creatinine and liver enzymes) on a Microlab 200 Merck chemical analyzer. Urine culture and abdominal imaging were performed where indicated. For the diagnosis of malaria, a peripheral blood smear test for malaria parasite was adopted as the gold standard. A complete blood test was performed using the Sysmex KX21 automated hematology analyzer and peripheral smears were tested which were blinded by the results of the automated hematological analyzer. Two index tests were selected, i.e. Hemoglobin and platelet count. For low hemoglobin (anemia), a cut-off value of 10 gm / dL was used, and platelets below 150 x 109 / L were used to define thrombocytopenia. Patients with reduced platelet counts were re-evaluated by manual method. Thrombocytopenia patients were divided into three categories. Mild thrombocytopenia was defined as patients with platelet counts <150 x 109 / L to> 50 x 10 g / L. Moderate thrombocytopenia in patients with platelet counts <50x109 / L to> 20x109 / L and severe thrombocytopenia in patients with platelet counts <20x109 / L.

RESULTS:

A total of one hundred (100) patients with positive malarial parasite (MP) smear were selected and studied in detail. Of these, 91 (91%) reduced platelet counts, and only 09 (9%) had normal numbers. Those with low numbers, seventy-two patients 72 (72%) were mild and 19 (19%) had moderate thrombocytopenia. None of them had a severe form of the disorder (Table 1).

Table 1: Platelet counts in patients with malaria (n = 100)

Platelet count X 10 /L	=n	%age
<20	-	-
20-50	19	19
50-150	72	72
>150	9	9

Ninety-five patients (95%) had Vivax and only five patients (5%) had Falciparum malaria. Positive for the patient due to malaria falciparum (i.e. 05) and positive for Vivax, i.e. 14 patients had moderate thrombocytopenia (Table 2).

Table 2: Platelet Counts in P. Vivax and P. Falciparum malaria

	Plasmodium Falciparum	Plasmodium Vivax
No patient	5	95
<20x10^9/L	-	-
20-50 x10^9/L	5	14
50-150 x10^9/L	-	72
>150 x10^9/L	-	9

The average number of platelets was 93x109 / L (normal 150-400x109 / L. The maximum number of platelets was 193x109 / L and the minimum number was 30x109 / L. The average number of platelets in Falciparum was 54x109 / L, while it was 98x109 / L in Vivax malaria. Sixty-eight (68%) patients had anemia. The mean hemoglobin (Hb) was 9.20 g / dl, while the maximum Hb was 13.8 gm / dl and the minimum Hb was 6.5 gm / dl. The average Hb in Falciparum malaria was 8.0 gm / dI and in vax 9.40 g / dl.

DISCUSSION:

Malaria is known to be the most common cause of acute fever disease in all developing countries, including Pakistan. Clinical symptoms overlap with other diseases that make their diagnosis difficult. Regarding hematological results, such as thrombocytopenia and anemia, it also occurs in other disorders. Thrombocytopenia occurs in 60-80% and anemia is 25%. The association of thrombocytopenia and anemia is an important indication for the diagnosis of malaria in patients suffering from acute febrile illness. The cause of thrombocytopenia is not fully understood, but the increase in platelet damage is important and platelet life is reduced during malaria[9-10]. The mechanisms recommended for thrombocytopenia include extensive intravascular coagulation or excessive platelet clearance by the reticuloendothelial system. IgG anti-platelet antibodies also played a role in the pathogenesis of thrombocytopenia. Thrombocytopenic malaria, unlike non-thrombocytopenic diversity, is associated with higher levels of parasitism and higher cytokine production. In this study, 91% of patients with malaria had thrombocytopenia to some extent[11]. Thrombocytopenia is considered to be an important predictor of Falciparum malaria violence in children. The average platelet count in Falciparum was found to be lower (54x109 / L) compared to Vivax malaria (98x1 09 / L). Mean hemoglobin was lower in Falciparum compared to Vivax malaria. However, in this study, Shuaib et al., Who found severe thrombocytopenia in 10% of patients. Compared with severe thrombocytopenia, no observed. In this study, thrombocytopenia was 91% with anemia and 68%. Malik NA et al. In his research, Alfonso J et al. 54% anemia and 93% thrombocytopenia were reported[12-13]. They also found similar results. Virus-induced thrombocytopenia is observed in patients with acute febrile disease, but the presence of other researchers, especially anemia, is considered a possible diagnostic sign of malaria in endemic regions20. For this reason, patients with acute febrile disease without localized symptoms and a combination of anemia and thrombocytopenia should warn the physician about the possibility of malaria infection, which can be confirmed by specific tests such as malaria parasites and transmission technique. Immune-chromatographic (ICT) [14-15]. It is therefore important to remember that a better understanding of malaria biology will help in the elimination of malaria and that we will allow us to select new drugs with minimal non-target effects, killing P data from the extended repertoire of antimalarial agents. Circulating falciparum gametocytes, thus preventing conduction.

CONCLUSIONS:

Reported incidence of mild to moderate thrombocytopenia and anemia was significantly higher in our study population, but these results can be used as a tool to diagnose and treat patients outside, which reduces the burden of indoor services with financial benefits for patients at the same time.

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