SHORT REPORT: HEMATOLOGIC CHANGES IN ACUTE, IMPORTED \textit{PLASMODIUM FALCIPARUM} MALARIA

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Abstract. We conducted a retrospective analysis of hematologic changes in 89 patients with imported \textit{Plasmodium falciparum} malaria. Thirteen (15\%) were anemic at presentation, 60 (67\%) had thrombocytopenia, and 63\% had lymphopenia. There was a significant inverse relationship between parasitemia and platelet count. Anemia is rare among patients with imported malaria, while thrombocytopenia and lymphopenia are common.

Anemia and thrombocytopenia are common among patients with \textit{Plasmodium falciparum} malaria.\(^1\) However, most studies of hematologic abnormalities among such patients have been conducted in endemic countries whose populations have frequent attacks of malaria and a high prevalence of nutritional deficiencies and hemoglobinopathies, all of which distort the hematologic picture. Relatively few studies have been performed of hematologic abnormalities among nonimmune or semi-immune travelers returning from the tropics with malaria. We therefore conducted a retrospective analysis of hematologic indices among adult patients with \textit{P. falciparum} malaria presenting to a specialist tropical disease hospital in London.

All patients with slide-positive \textit{P. falciparum} malaria who presented between January and July 1994 were identified. Clinical details were recorded from the case notes and included demographic data, travel history, duration of symptoms, information on other medical conditions, percentage parasitemia, and results of a full blood count (performed using a Coulter [Hialeah, FL] counter). Of 101 patients, 12 were excluded because of hemoglobinopathy (4), missing case notes (2), pregnancy (2), chronic hepatitis C (1), acute Epstein Barr virus (1), interstitial nephritis (1), and a history of recent major surgery (1). Data were recorded onto a standard form and analyzed using commercial software (EPI-INFO version 6.0; Centers for Disease Control and Prevention, Atlanta, GA).

Of the remaining 89 patients, 59 were male. The mean age was 35.9 years (range = 19–74 years). Most (69, 78\%) lived in the United Kingdom but 50 (56\%) originated from sub-Saharan Africa; 48 patients (54\%) were black, 36 white (40\%), and five Asian (6\%). All had been in an endemic area within the last 13 months, commonly sub-Saharan Africa (81, 91\%). Median time to presentation was 11 days after return (range = 0–393 days).

Parasitemia ranged from 0.0001\% to 20\%. Most patients (67, 75\%) had a parasitemia < 1\%. Twenty-one patients (24\%) had values between 1\% and 5\%. Four patients had mixed infections with \textit{P. vivax}.

Anemia was defined as a hemoglobin level < 12 g/dL for men and < 10 g/dL for women. Using these criteria, 13 (15\%) were anemic (nine males [15\%] and four females [13\%]). Six (7\%) patients were leukopenic, while too (2\%) had a leukocytosis. Of 82 patients who had a lymphocyte count measured, 52 (63\%) were lymphopenic. Sixty-six (67\%) patients were thrombocytopenic, and 29 (33\%) had a platelet count < 100 × 10^9/L (Table 1). There was a significant inverse relationship between parasitemia and platelet count (r = −0.31, P < 0.01). There was no demonstrable relationship between parasitemia and either hemoglobin (r = −0.11) or total lymphocyte count (r = −0.16). There were no significant differences in total white blood cell or lymphocyte counts of black patients compared with white patients; white blood cell counts are known to be lower in people of African origin than in Caucasians.\(^2\)

The number of cases of malaria imported into the United Kingdom increased from 101 in 1970 to 2,055 in 1995 (data of the Malaria Reference Laboratory, London, United Kingdom), yet few data have been reported from travelers returning from endemic areas with acute \textit{P. falciparum} malaria. One report from Canada suggested that 28\% of cases of imported malaria had anemia, though none had a hemoglobin concentration less than 7.0 g/dL, while 50\% had thrombocytopenia,\(^3\) figures that are broadly in agreement with our own. In contrast to malaria in endemic areas, these data suggest that anemia is relatively rare among cases of imported \textit{P. falciparum} malaria, while thrombocytopenia and lymphopenia are common.

Acknowledgments: We are very grateful to Professor G. Pasvol for helpful discussions.

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REFERENCES

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Hematologic abnormalities in 89 patients with acute, imported \textit{Plasmodium falciparum} malaria & No & No. tested & \% \\
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Anemia & 13 & 89 & 15 \\
Men, hemoglobin < 12.0 g/dL & 9 & 59 & 15 \\
Women, hemoglobin < 10.0 g/dL & 4 & 30 & 13 \\
Leukocytosis > 11.0 × 10^9/L & 2 & 89 & 2 \\
Leukopenia < 3.5 × 10^9/L & 6 & 89 & 7 \\
Lymphopenia < 1.5 × 10^9/L & 52 & 82 & 63 \\
Thrombocytopenia & < 150 × 10^9/L & 60 & 89 & 67 \\
& < 100 × 10^9/L & 29 & 89 & 33 \\
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\caption{Hematologic abnormalities in 89 patients with acute, imported \textit{Plasmodium falciparum} malaria}
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