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Original Article

Malaria: An evaluation of three Africa-borne cases

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Abstract. Malaria is a parasitic infectious disease caused by the *Plasmodium* species, seen especially in tropical and subtropical regions. Generally, the *Plasmodium (P.) vivax* species is seen within Turkey. However, the *P. falciparum* and *P. malariae* species may also be seen in patients with a history of travel abroad. Cases have been detected in the city of Van, and the patients were found to be individuals who had worked abroad. As this disease is not very common within Turkey, three patients diagnosed with malaria, who had formerly traveled to different countries of Africa for work but who normally live in Van, are presented in this study.

Key words: Malaria, diagnosis, therapy

1. Introduction

Malaria remains as the most serious public health problem in Africa. Malaria is a parasitic infectious disease caused by the *Plasmodium* species, seen especially in tropical and subtropical regions (1). Generally, the *Plasmodium (P.) vivax* species is seen within Turkey. However, the *P. falciparum* and *P. malariae* species may be seen in patients with a history of travel abroad (2). The disease is a parasitic disease that is transmitted through the bites of infected female anopheles, by infusion with infected blood, or through organ transplantation. The disease begins with acute paroxysmal bouts of fever. With the various improvements in Turkey, there is much more abroad travelling, especially to the African continent, which has caused an increase in the frequency of detection of travel-borne diseases. The aim of this study is to evaluate the demographic, clinical, and laboratory data of the aforementioned three cases from Van, in patients who caught malaria due to their employment in different countries of the African continent.

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2. Materials and methods

Between the years 2010 and 2011, the three cases of malaria in Van at Yuzuncu Yil University Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, were evaluated retrospectively. For these cases, the diagnosis was carried out by detecting malaria parasites on smear examinations stained with Giemsa.

3. Results

All of the patients were male and their mean age was 27 years. All three of them had been working in African countries such as Ethiopia, Sudan, and Tanzania for over two months, and had returned home nearly two weeks previously. All of the patients had cold chills, fatigue, headache, sweating, body aches, nausea, and vomiting, and two patients had abdominal pain and clinical signs. In all of the patients, there were also signs of fever and hepatosplenomegaly. All were found to have anemia, leukopenia, and thrombocytopenia on laboratory evaluation. All three had increased AST, ALT, LDH, and CRP, and two had elevated erythrocyte sedimentation rate and bilirubin. The malaria diagnosis was reached in each patient by detecting *P. vivax* trophozoites within erythrocytes on smears. Two of the patients were treated with quinine sulfate (3 x 600 mg for 7 days) plus doxycycline (2 x 100 mg for 14 days), and the other patient was treated with chloroquine (first day 1000 mg, then 500 mg after 6 hours and on days 2 and 3) plus

primaquine (15 mg/day for 14 days). No parasites were detected on the 3rd- and 7th-day smears in the first two cases. On the 7th and 14th days of the treatment with chloroquine and primaquine, the parasite continued to be seen for the third case. It was determined to be *P. vivax* because *falciparum* gametocytes and young trophozoite forms (trophozoites diameter of the red blood cell diameter ratio 06.01 to be around) were not seen on the thin-smear slides of this patient, and the parasites were large enough to cover one-third of the erythrocytes. The patient with prolonged fever was considered to have *P. vivax* malaria resistant to chloroquine, and treatment was started with mefloquine (750 mg plus 12 hours after the 1st day to 500 mg) plus artemether 20 mg/lumefantrine 120 mg tablets (2x4 for 3 days). Two units of thrombocyte suspension were given to the patient, who was found to have low thrombocytes during follow-ups. No parasites were found on the smear of the patient who had been treated with primaquine 15 mg/day for 14 days. All cases resulted in complete healing.

4. Discussion

Malaria is a protozoan infection caused by the *Plasmodium* species. Human pathogen *Plasmodium* species are *P. vivax, P. falciparum, P. ovale, and P. malariae.* In Turkey, the most frequent malaria determinant is *P. vivax*, and the common species *P. falciparum* and *P. malariae* are detected even though they are rare. Most cases with rare diagnoses have a history of travel abroad. Each year, many people travel as tourists from large, industrialized countries to tropical regions (9 million per year to Africa and 32 million per year to Asia and the Pacific region). This situation has been influencing the number of malaria cases (3).

All three of our cases had a history of travel abroad. The determinant transmits through bites from mosquitos called anopheles who inject sporozoites while sucking blood, or through obtaining infected erythrocytes through transfusion (4-6). The incubation period of the disease is between 2 and 4 weeks. Cold chills, high fever, and profuse sweating are the most important symptoms of acute malaria. It has been reported that certain problems are commonly faced, such as fever in 80%-100% of cases, gastrointestinal symptoms in 30% (nausea, vomiting, diarrhea, abdominal pain), fatigue in 30%, anorexia in 20%, and arthralgia and/or myalgia in 20%. The common complaints of our three patients were fever rising with chills and falling with sweating, weakness, headache, arthralgia, and myalgia. It has been reported that the prevalence of splenomegaly in malaria is between 11.5% and 97% (4-7). The prevalence of hepatomegaly in malaria ranges from 45% to 55% (8). All three of our cases had hepatosplenomegaly. Considering the laboratory findings, 50%–70% of cases were found with thrombocytopenia and 25%–33% with anemia (4,6,8). Considering the malaria series, approximately 80% of cases have LDH elevation and 25% have AST/ALT elevation. All three of our cases had elevated AST, ALT, and LDH, and two had elevated erythrocyte sedimentation rate and bilirubin.

The standard diagnostic method is to demonstrate parasites through light microscopy on thin-smear and thick-drop preparations stained with Giemsa (6). The malaria diagnosis was reached after detecting *P. vivax* trophozoites within erythrocytes on smears from each of our three patients.

Malaria treatment should be started immediately without any delay, according to the parasite species and the possible resistance of the region. The medications that should be preferred for the treatment of malaria in uncomplicated and sensitive cases are chloroquine, and if there is any chloroquine resistance, then mefloquine, quinine sulfate and doxycycline, atovaquone, proguanil, artemether, and lumefantrine (7,9). Primaquine phosphate is used to prevent relapse of *P. vivax* malaria (1,4,6). Two of our patients were treated with quinine sulfate plus doxycycline, and no parasites were seen on smears on the 3rd and 7th days. No parasites were seen on the 3rd-, 7th-, and 14th-day smears of the other patient, who had the chloroquine and primaquine treatment. Smears were repeated for the patient who had been thought to have *P. falciparum*. It was considered *P. vivax* because banana-shaped *P. falciparum* gametocytes and young trophozoite forms (trophozoites diameter of the red blood cell diameter ratio 06.01 to be around) were not seen on the patient's thin-smear slides, and parasites were found to be large enough to cover one-third of the erythrocytes. The chloroquine-resistant *P. vivax* mefloquine plus artemether/lumefantrine treatment was applied for three days. No parasites were found during follow-up of the patient who underwent primaquine treatment for two weeks in order to prevent relapse. All cases resulted in complete healing (10).

5. Conclusion

The possibility of malarial disease should not be overlooked in patients with a history of traveling abroad, chills and increasing fever,

fatigue, headache, hepatosplenomegaly, and thrombocytopenia.

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