Case Report: Hyper-reactive Malarial Splenomegaly in a Patient with Human Immunodeficiency Virus

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Abstract. Both hyper-reactive malarial splenomegaly (HMS) and HIV infection are highly prevalent in sub-Saharan Africa, but the inter-relationships between the two conditions are not clearly defined. Diagnosis of HMS is particularly difficult in HIV-infected patients, and detection of circulating malaria parasites by polymerase chain reaction (PCR) may represent a useful diagnostic tool.

INTRODUCTION

Hyper-reactive malarial splenomegaly (HMS) syndrome is observed most often in African individuals, and its frequency is underestimated. HMS is also recognized as an imported disease in malaria-free areas, but with low frequency. Pathogenic studies suggest a critical role of an aberrant immunologic response to malaria antigens after repeated exposures, resulting in splenic hypertrophy, sometimes associated with secondary hypersplenism. HIV infection is also widespread in sub-Saharan Africa, and several studies reveal complex interactions with malaria that may have dramatic population-based effects. However, the clinical significance of HMS in HIV-infected individuals is still scattered and incomplete. We report and discuss a case of HMS in an HIV-infected African immigrant in Italy.

CASE REPORT

In November 2004, a 57-year-old woman, born in Cameroon, who had entered Italy as an immigrant in August 2004, was admitted to the Infectious and Tropical Diseases Institute in Brescia, Northern Italy. She complained of abdominal pain, weight loss of ~10 kg, and low-grade fever of ≈10°C. Her past medical history was characterized by repeated malaria episodes and intestinal amoebiasis. On clinical examination, she was pale, with bilateral cervical lymphadenopathy, hepatomegaly, and a remarkably enlarged spleen (longitudinal diameter 19.5 cm at ultrasonography). Laboratory investigations showed hemoglobin 8.4 g/dL, red blood cells = 2,820 × 10^12/mm^3, white blood cells = 2,520 × 10^9/mm^3 with abnormal differential count (lymphocytes = 50.5%, neutrophils = 14.2%, eosinophils = 22.5%, basophils = 14%), and platelets = 120 × 10^12/mm^3. Creatinine was 1.8 mg/dL, and urine analysis revealed nonselective glomerular proteinuria. Total serum gamma globulins were increased (44.2%), with IgG 3,105 mg/dL (normal range, 600–1,350 mg/dL) and IgM 990 mg/dL (normal range, 50–350 mg/dL). Iron pattern, liver enzymes, and chest x-ray were normal. HIV test was offered and accepted, which gave a positive result. Moderate immunodeficiency (T4 lymphocytes = 297 cells/mm^3) and high viral load (HIV RNA > 500,000 copies/µL) were demonstrated. Serology for schistosomiasis, leishmaniasis, Parvovirus B19, typhoid fever, Epstein-Barr virus, hepatitis B and C viruses, and cytomegalovirus DNA were performed and gave negative results. Hemoglobin electrophoresis was normal. Stools were examined for parasites, but none could be identified. Malaria parasites were repeatedly searched for in thick films stained with 1% Giemsa, but no parasites were identified in 300 oil-immersion fields by an experienced microscopist. Plasmodium falciparum antibodies were detected by indirect immunofluorescence assay at a titer of 1:2,560. PCR analysis for malarial DNA was performed on blood samples collected on the day of admission: both genus-specific real-time PCR and P. falciparum species-specific nested-PCR were positive. The gene amplified was 18 rRNA. The reaction was performed using the protocol described by Lee and others.

A diagnosis of HMS was made, according to Fakunle’s criteria. A single dose of mefloquine (500 mg) was administered, the dose being adjusted for reduced renal function. Three days afterward, fever was cleared and molecular assays for Plasmodia were negative, but hypersplenism and pancytopenia improved more slowly. Two months after mefloquine treatment, spleen size was reduced to 14.8 cm, and the abdominal pain improved accordingly. Total serum IgM normalized, and the IFAT malaria titer showed a 4-fold reduction (1:640).

Anti-retroviral therapy was started with dose adjustment for the renal function using lamivudine 150 mg/day, stavudine 15 mg twice/day, and nevirapine 200 mg/day. A few days later, the patient developed continuous fever up to 38°C, severe anemia (Hb 7.6 g/dL), and high creatinine serum levels (7.6 mg/dL). Anti-retroviral therapy was discontinued, and a renal biopsy performed, which showed HIV-related focal and segmental glomerulosclerosis (HIV-associated nephropathy, HIVAN).

DISCUSSION

Because of the increasing number of immigrants from areas where both malaria and HIV infection are highly prevalent, physicians in industrialized countries should consider HMS in the differential diagnosis of HIV-infected patients with marked splenomegaly.

Differential diagnosis of splenomegaly in HIV-infected individuals from the tropical belt is complex and should include several conditions, such as HBV, HCV, EBV, CMV, Leishmania, and Schistosoma infections as well as malignant lymphoproliferative disorders. In our case, all of these conditions were ruled out and the diagnosis of HMS was based on...
Fakunle’s criteria, which do not differ in HIV-seronegative or HIV-seropositive individuals: major criteria were marked splenomegaly, high antibody levels to *P. falciparum*, serum IgM at least 2 standard deviations above the mean laboratory value, and clinical and immunologic response to antimalarials. Among minor criteria, hypersplenism was present.

Initially, malaria parasites were not detected at microscopic examination because of the low sensitivity of the technique in cases of HMS. Evidence of malarial infection is indirect in many HMS patients, and is based on serological criteria; immunohistochemical demonstration of *P. falciparum* antigens in liver cells is a very specific but invasive method. Direct demonstration of specific malarial DNA in the blood with nested PCR and real-time PCR can provide further evidence for diagnosis of HMS. PCR investigations, even qualitative ones, are highly sensitive assays that have proved useful in diagnosis of persistent malaria infections and which might be useful confirmatory techniques in industrialized countries in diagnosis of HMS. In HIV-infected individuals, such evidence would prevent misleading diagnoses and use of inappropriate therapies.

To conclude, clinicians should be reminded that malaria can cause splenomegaly, regardless of HIV status, and that they still need to consider malaria in their differential diagnoses in patients with suitable travel histories. Further research is warranted, which ideally should be conducted in countries where both HIV infection and malaria are highly prevalent.

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