CASE REPORT

DENGUE VIRUS INFECTION IN A PATIENT WITH CHRONIC MYELOID LEUKEMIA

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Abstract. This is a case report of a patient with chronic myeloid leukemia (CML) undergoing imatinib treatment who became infected with dengue virus. The patient presented with classic dengue symptoms, along with early minor bleeding (blood-stained sputum) during the first 5 days of illness. Continuous inpatient imatinib treatment for CML was given without blood transfusion. The hemoglobin and white blood-cell count slowly improved over 30 days while recovering from the dengue viral infection. The patient recovered from the dengue virus infection without complication. Clinical monitoring of hematologic changes is needed in dengue patients undergoing anticancer treatment.

Keywords: chronic myeloid leukemia, dengue viral infection, imatinib

INTRODUCTION

Dengue virus infection is a common tropical infectious disease (Leo *et al*, 2011). Patients with underlying hematologic malignancy who live in tropical areas are also at risk for dengue infection. Dengue virus infection causes leukopenia and thrombocytopenia, which can mimic problems found in hematologic malignancies.

Chronic myeloid leukemia (CML) can be treated with fewer complications using imatinib, compared to interferon or hydrea therapy. Imatinib (Glivec®; Novartis Pharma AG) is an oral anticancer agent that is a specific inhibitor of the tyrosine kinase protein, of the breakpoint cluster region of the Abelson murine leukemia gene (BCR-ABL), producing a dramatic response and increasing survival rates among CML patients (Kantarjian *et al*, 2003; Druker *et al*, 2006). This medication temporarily reduces the number of white blood-cells and platelets during treatment of CML (Khouri *et al*, 2008). Thus, there is some difficulty identifying dengue infection among patients undergoing imatinib treatment for CML. One study reported recovery from dengue infection in a patient treated for CML with bone marrow transplantation (Sharma *et al*, 2011). Little data exists regarding the impact of den-

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Table 1
Laboratory findings in a patient with CML and dengue infection.

Day of illness	5	7	9	10	11	12	19	32	62
Body temperature (°C)	37.8	37.5	37.0	37.0	36.8	36.8	N/A	N/A	N/A
Hematocrit (%)	32.9	25.9	23.3	25.3	25.7	23.7	27.9	33.9	36.9
WBC (x10^3/ l)	6.9	2.6	2.4	2.7	3.1	2.7	2.5	4.3	9.1
Neutrophils (%)	66.0	47.0	25.0	30.0	33.0	60.0	35.0	47.8	60.7
Lymphocytes (%)	24.0	46.0	66.0	61.0	57.0	34.0	54.0	46.9	32.7
Atypical lymphocytes (%)	0	0	1.0	2.0	0	0	0	0	0
Monocytes (%)	4.0	2.0	2.0	2.0	0	2.0	3.0	1.6	2.5
Eosinophils (%)	2.0	1.0	2.0	3.0	7.0	3.0	3.0	1.6	3.5
Basophils (%)	4.0	4.0	4.0	2.0	3.0	1.0	5.0	2.1	0.6
Platelet count (x10^3/ l)	177	85	97	115	123	120	137	194	289
AST (U/l)			45	42		26			24
ALT (U/l)			85	72		46			37
Dengue IgM	Positive					Negative			
Dengue IgG	Negative					Positive			

gue infection among patients undergoing anticancer treatment for CML.

CASE REPORT

A 42-year-old man was diagnosed with having CML in February 2012 using bone marrow aspiration, biopsy and analysis of chromosomes (XY, t(9;22)(q34;q11.2). The patient presented with leukocytosis (WBC= 303 x10^3/ l). Imatinib (Glivec®), 400 mg/day, was used to treat the patient. During the 1st month of treatment, he developed high-grade fever, anorexia blood-stained sputum, myalgia, nausea, vomiting and headache, without retro-orbital pain. On examination he had hepatosplenomegaly. Laboratory examination on day 5 of fever revealed a positive ELISA test (Standard Diagnostics, Suwon, Korea) for dengue IgM and a negative test for dengue IgG (Table 1).

The patient remained febrile to 37.8°C during the first 2 days of hospitalization, then subsided. He had no other clinical signs of bleeding except for the blood-stained sputum on the day of admission. During hospitalization, he was treated with imatinib (400 mg/day), anti-emetic medication (domperidone), and intravenous fluids. Ultrasonography and chest x-ray were performed on the first day of fever defervescence (seventh day of illness) to detect plasma leakage. The results identified hepatosplenomegaly with a normal gallbladder and no evidence of ascites or pleural effusion. The patient had no signs of plasma leakage or dengue shock syndrome. He was discharged home on the fifth day of hospitalization and followed up as an outpatient without any sequelae from the dengue infection. His CML was followed for hematological response until the fourth month after starting imatinib treatment.

DISCUSSION

Patients with dengue infection may present with high-grade fever, leukopenia and thrombocytopenia. Patients with pre-

existing hematological conditions, such as CML, may also have cytopenia. Patients with CML living in dengue endemic areas are also at higher risk for dengue infection. The clinical presentation of patients with concomitant dengue infection and CML have rarely been reported.

This patient presented with a 5-day fever, myalgia, headache, bleeding manifestations and leukopenia, which fits the 1997 WHO probable case definition for dengue (WHO, 1997). This patient presented with bleeding manifestations early in infection because of a pre-existing disease and the use of medication that suppresses the bone marrow (Mitrakul *et al,* 1977; Khouri *et al,* 2008). Physicians could have confused this with the side-effects of imatinib, but it does not explain all the presenting signs and symptoms. Hepatomegaly is not a clinical criterion for dengue infection and can be present in cases of hematological malignancy. The clinical diagnosis of dengue infection was difficult due to the overlapping clinical signs and symptoms between the two diseases. Patients with dengue infection present primarily with an acute febrile illness, gastrointestinal symptoms (such as vomiting), myalgia and bleeding manifestations.

The clinical course in this case was similar to a healthy person with dengue infection, except this patient presented with bleeding manifestations. Sharma *et al* (2011) found dengue patients with underlying hematological disease were at high risk of bleeding, and may require blood transfusion. This patient had mild thrombocytopenia and had a mild degree of bleeding. Leukopenia developed abruptly after the onset of infection and continued for 1 month after the dengue infection resolved. This finding could have been due to the concomitant use of anticancer treatment (Khouri *et al,* 2008; Visuthrnukul *et al,* 2009).

Serial hematological laboratory parameters show patients recover slowly from dengue infection. Awareness of the clinical presentations of dengue among hematological patients is needed in risk areas. Patients with pre-existing hematological disease and concomitant bone-marrow suppressive medication need to be monitored carefully in dengue infection.

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