NEXUS OF INFECTION WITH HUMAN IMMUNODEFICIENCY VIRUS, PULMONARY TUBERCULOSIS AND VISCERAL LEISHMANIASIS: A CASE REPORT FROM BIHAR, INDIA

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Abstract. A 37-year-old man was diagnosed as being infected with human immunodeficiency virus (HIV), tuberculosis (TB), tuberculosis of the brain, and visceral leishmaniasis (VL) at the Rajendra Memorial Institute of Medical Sciences in Bihar, India. He had taken anti-tuberculosis therapy (ATT) for two and a half months and had episodes of convulsions with loss of consciousness, tongue bites, and incontinence of urine. The results of a neurologic examination were normal except for a left plantar extensor. He was positive for both HIV-I (confirmed by Western blot) and VL (confirmed by splenic aspirate). Treatment was initiated with amphotericin B lipid complex, a four-drug regimen (rifampicin, isoniazid, ethambutol, and pyrazinamide) of ATT, highly active antiretroviral therapy, anti-convulsants, and other supportive therapies. A repeat computed tomography scan of the brain showed the disappearance of the lesion followed by gliosis. After six months, he was also cured of VL. The triad of infections (HIV, VL, and TB) is a real threat in Bihar as an emerging combination of diseases of public health importance. Keeping these facts in mind, efforts to develop simple and cost effective diagnostic techniques coupled with affordable therapeutic facilities are urgently needed in developing countries.

INTRODUCTION

Infection with human immunodeficiency virus (HIV) was first detected in India in 1986 in Chennai among commercial sex workers (CSWs). Currently, an estimated 4.1 million people in India have HIV/acquired immunodeficiency syndrome. It is presumed that during the next decade, India is poised to be one of the few countries with the number of HIV-infected individuals comparable with that in sub-Saharan Africa, if appropriate preventive interventions are not developed.1,2 Bihar, an eastern Indian state, is still considered to have low prevalence of HIV infection in India. Tuberculosis (TB) is a common disease in this state. Parts of Bihar are hyperendemic for visceral leishmaniasis (VL). Of the total global incidence of VL, 90% of the cases are reported from India, Bangladesh, Nepal, Sudan, and Brazil.3 Most of the cases in India are concentrated in Bihar and its surrounding states of West Bengal and Uttar Pradesh. Individuals infected with HIV tend to acquire co-infection with other diseases that are endemic in that particular region. In this paper, we report a case infected with HIV, VL, TB, and tuberculoma of the brain. This is a unique example in which an endemic disease (VL) co-infects an individual infected with HIV, a virus that is slowly being introduced into this region in the presence of a common opportunistic infection (TB).4-6

CASE REPORT

A 37-year-old man was admitted to the Rajendra Memorial Institute of Medical Sciences in Bihar, India on July 13, 2001 with fever (39°C) associated with rigor and night sweats for the past six months. He also had mild cough with mucoid expectoration and was diagnosed to have TB. He was treated with a four-drug regimen (rifampicin, isoniazid, ethambutol, and pyrazinamide [RHEZ]: rifampicin, 450 mg once a day; isoniazid, 300 mg once a day; ethambutol, 1,000 mg once a day; and pyrazinamide, 1,500 mg once a day, all orally for two months; then rifampicin, 450 mg once a day and isoniazid, 300 mg once a day for four months) of anti-tuberculosis therapy (ATT), which he discontinued after two and a half months. During the next three months, he had episodes of loss of consciousness (each lasting for 15–20 minutes) accompanied by tongue bites and incontinence of urine. He had lost about 6 kg of body weight during this period. He also complained of intermittent headache, but there was no vomiting. He had no visual disturbances. His blood pressure was 120/80 mm of Hg. Examination of his chest showed the presence of coarse crepitations, especially in the right mid and upper zones. The results of a neurologic examination were normal except for a left plantar extensor. There was massive hepatosplenomegaly, with the spleen being larger than the liver. A routine blood examination showed moderate anemia (hemoglobin % = 7.4 g/dL), borderline leukopenia (white blood cell count = 4,300/mm³), an adequate number of thrombocytes (125,000/mm³), an increased erythrocyte sedimentation rate (40 mm in the first hour), and absence of malarial parasites. Testing for HIV showed that the individual was positive for HIV-1 (confirmed by Western blot). The CD4+ T cell count was 310/μL, the CD8+ T cell count was 550/μL and the CD8+/CD4+ ratio was 1.8. A test result for hepatitis B surface antigen was negative. A chest radiograph was suggestive of TB. A computed tomography (CT) scan of brain showed a ring lesion with surrounding edema in the right parietal lobe with evidence of mild brain atrophy (Figure 1A). The patient was diagnosed as being infected with HIV, and having TB with tuberculoma of the brain and VL.

Treatment was initiated with amphotericin B lipid complex (Ambisome®; Gilead Sciences, Ltd., Dublin, Ireland), a four-drug regimen (RHEZ) of ATT, highly active antiretroviral therapy, anti-convulsants, and other supportive therapies.7,8 The patient showed improvements two months after the initiation of therapy, and the TB and tuberculoma of the brain showed remarkable improvement after six months. The anemia improved, he showed a gain in body weight, his cough subsided with a remission of the fever, and the convulsions became less frequent and finally stopped. The patient contin-

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ued to receive highly active antiretroviral therapy and anticonvulsants. A CT scan of the brain six months after the initial scan showed disappearance of lesion followed by gliosis (Figure 1B). Liver and spleen sizes regressed and *L. donovani* bodies could not be recovered from a splenic aspirate at the six-month follow-up.

**DISCUSSION**

The patient reported that he traveled to Kolkata for business purposes and frequently visited commercial sex workers (CSWs). Many such migrant laborers from Bihar are reported to visit CSWs in large metropolitan cities such as Mumbai, Chennai, Pune, and Kolkata, where HIV infection among CSWs is alarmingly high and thus acquire HIV infection from those regions. Since Bihar is highly endemic for VL, individuals from this city may already harbor this infection or their HIV status triggers a latent infection with VL. Poverty, overcrowding, and malnutrition also make them vulnerable to acquire TB. Thus, in this case report, we encountered the nexus of the three major diseases that together make a diagnosis difficult and pose a genuine therapeutic challenge. To treat these diseases simultaneously, we had to use a large number of medications that fortunately did not result in any drug interactions. However, the cost of such elaborate diagnostic procedures and treatment was very high and beyond the reach of most people in developing countries such as India. In this instance, had the individual not reached our government hospital (where patient care is provided free of charge) on time, albeit delayed, he would probably have died prematurely, undiagnosed, and inadequately and improperly treated, being unable to meet the expenditure for such expensive treatment.

It is a matter of grave concern that HIV-positive individuals are vulnerable to the nexus of HIV and concomitant multiple co-infections with locally endemic diseases such as VL. Poverty and malnutrition, which are rampant in developing countries, make the situation more complicated as far as diagnosis, treatment, and disease progression are concerned. The triad of infections (HIV, VL, and TB) is a real threat in Bihar as an emerging combination of diseases of public health importance with devastating potentials. Keeping these facts in mind, efforts to develop simple and cost-effective diagnostic techniques coupled with affordable therapeutic facilities for developing countries are urgently needed. Fortunately, directly observed treatment short-course therapy for TB is provided by the government free of charge. Antimony preparations and pentamidine for the treatment of VL are also provided free of charge. Miltefosine, the first ever oral drug developed for the treatment of leishmaniasis, is now available in India and it is expected that its price will soon decrease. Drugs for the treatment of HIV are already available at reasonable prices in India and the government is supplying nevirapine free of cost to prevent mother-to-child transmission.

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