Case Report

Tropical Spastic Paraparesis-Like Illness in an HIV-Infected Child

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Abstract

Human T-cell leukemia virus type 1(HTLV-1) is the etiological agent responsible for the clinical entity of tropical spastic paraparesis/HTLV-1-associated myelitis (TSP/HAM). HTLV-1 and HIV-1, being related retroviruses, coinfection with both is a well-recognized phenomenon but rarely reported in children. We describe a 5-year-old boy with no previously known comorbidity who presented with bilateral lower-limb weakness and calf pain along with urinary retention. Imaging confirmed the presence of myelitis. Investigations showed elevated creatine phosphokinase(CPK) values suggestive of myositis. It was later learned that the parents of the child were on treatment for HIV infection. Antibodies for HIV were positive by ELISA, and in view of the clinical picture, probability of a TSP-like illness as the initial presentation of a hitherto undiagnosed HIV infection was considered. TSP/HAM is an important yet underrecognized cause of spinal disease, especially in HIV-infected individuals. Certain features such as elevated to normal CD4 counts, absence of significant sensory symptoms, and associated myositis may serve as subtle clues to underlying HTLV-1 infection.

Keywords: *HIV, human T-cell leukemia virus, myelopathy, pediatric HIV, retroviral infection, tropical spastic paraparesis/human T-cell leukemia virus type 1-associated myelitis*

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Introduction

Spinal cord disease in HIV infection could be attributable to multiple causes. Primary HIV-associated acute transverse myelitis occurs in early infection or at seroconversion, while HIV vacuolar myelopathy and opportunistic infections predominate in uncontrolled disease.[1] The human T-cell leukemia virus type 1 (HTLV-1), being similar to the distantly related HIV-1, is classified in the *Deltaretrovirus* genus of the Orthoretroviridae subfamily of retroviruses.[2] Tropical spastic paraparesis (TSP), or as it was previously known, "Jamaican neuropathy," was first described in 1964, though its etiology remained obscure until 1985 when HTLV-1 was firmly implicated in its pathogenesis.[3] HTLV-1 infection remains an important yet underdiagnosed cause of myelopathy, especially in the HIV-infected population. Here, we present a 5-year-old boy with myelopathy with HIV-1 infections most likely due to TSP and discuss the unique aspects of HIV/HTLV-1 dual infection.

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Case Report

A 5-year-old boy presented in 2018 with fever and difficulty in walking for a week, associated with urinary retention for 2 days. The child also reported pain in bilateral lower limbs. He had no other illnesses in the past. On examination, weight was 14 kg and height was 96 cm. General examination was normal. On systemic examination, he had a bilateral symmetric lower-limb weakness with power 2/5, with associated spasticity and exaggerated deep tendon reflexes. Urinary bladder was palpable. Bilateral calf tenderness was present on palpation. No discernible discrete sensory level could be demonstrated. Investigations showed hemoglobin of 11.9 g/dl, white cell count of 8340 cells/cumm, and platelets of 299,000 cells/cumm. Creatine phosphokinase was 33910 IU/L (normal: 50–180 IU/L). Spinal magnetic resonance imaging (MRI) showed abnormal

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signal intensity in the cervical and dorsolumbar cord extending from C2 to C6 and D10 to L1, suggestive of myelitis [Figure 1]. Cerebrospinal fluid (CSF) analysis revealed proteins 134 mg/dl, sugars 64 mg/dl, and 30 cells (100% lymphocytes). Only on eliciting further history, it was found that parents were on treatment for HIV infection. Although complete perinatal details were not available, it was confirmed that the child did not receive any postnatal prophylaxis or underwent screening for the disease. HIV ELISA of the child was done which was positive. The HIV viral load was 22,400 copies/ml, and the absolute CD4 count was 1538 cells/µl. Antinuclear antibody, CSF aquaporin-4 antibody, CSF oligoclonal bands and serum myelin oligodendrocyte glycoprotein antibodies were done to rule out other differentials and were all negative. Although a probable diagnosis of TSP-like illness with probable HTLV/HIV coinfection was made, CSF or serum samples for HTLV testing could not be sent due to financial constraints.

During hospital stay, the child's weakness was persistent but nonprogressive. Mantoux test and chest X-ray were normal. The child was pulsed with steroids (IV methylprednisolone at a dose of 30/mg/day for 5 days), with which significant clinical improvement was noted. CPK values monitored serially showed a decreasing trend with liberal fluid therapy and normalized within a few days. The child was initiated on first-line antiretroviral therapy (ART) consisting of zidovudine (AZT), lamivudine (3TC), and efavirenz and asked to follow up in the pediatric HIV clinic.

Discussion

The causes of myelopathy in HIV infection include vacuolar myelopathy as well as numerous infective causes such as cytomegalovirus, varicella-zoster virus, herpes simplex virus type 2, toxoplasmosis, and tuberculosis.[4] Presentation early in the course of the disease, coexisting myositis and an aseptic meningitis picture on CSF were features in favour of TSP.

HTLV-1's causative role in major disease associations – adult T-cell leukemia, HTLV-1-associated myelitis (HAM)/TSP, and uveitis – is epidemiologically proved. Southwestern part of Japan, sub-Saharan Africa and South America, the Caribbean area, and some areas in the Middle East and Australia-Melanesia are highly endemic regions for HTLV.[5] The modes of HTLV-1 transmission – i.e., vertical transmission, sexual transmission, and transmission with contaminated blood products – are similar to that of HIV increasing chances of coinfection. Epidemiological studies done among high-risk population in South India in the past decades have confirmed an increased prevalence of HTLV-I/II antibodies among the HIV-seropositive population.[6] HIV/HTLV-1-coinfected subjects may be at increased risk for developing TSP/HAM. Conversely, multiple epidemiological and *in vitro* studies have suggested that HTLV-1 infection can promote HIV-1 replication and accelerate the clinical progression to AIDS, owing to shared CD4-mediated pathogenesis.[7,8] A case report noting the occurrence of TSP/HAM has been documented following the initiation of highly active antiretroviral therapy, presumably due to an immune reconstitution has been documented.[9] Studies also show a consistent pattern of normal to elevated CD4 counts along with the absence of significant sensory symptoms and presence of polymyositis at the time of presentation in TSP/HAM patients with coinfection, as was seen in our patient.[10,11]

Treatment of TSP/HAM in individuals with steroids, danazol, interferon-alpha, Vitamin C, cyclosporine, etc.,

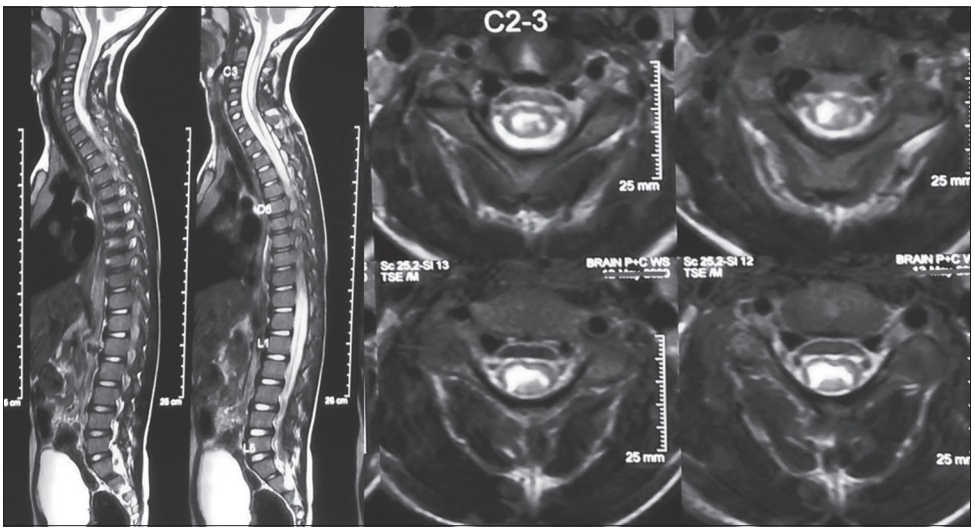

Figure 1: T2 hyperintensities from C2 to C6 and D10 to L1 vertebral levels on spinal magnetic resonance imaging

has been attempted, although only anecdotal evidence or limited trials exist for their use.[12] Our patient had a remarkable recovery with steroids.

To summarize, it is reasonable to consider the diagnosis of TSP/HAM due to HTLV-1 in an HIV-infected patient with spastic paraparesis with myositis and near-normal CD4 count.

Patient consent

Written consent was obtained.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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