

Meningoencephalitis and New Onset of Seizures in a Patient with Normal Brain CT and Multiple Lesions on MRI

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Toxoplasmic encephalitis is the most common cerebral mass lesion in patients with AIDS. The definitive diagnosis requires direct demonstration of the tachyzoite form of *Toxoplasma gondii* in cerebral tissue. The presumptive diagnosis is based on serology, clinical and radiological features, and on response to anti-*Toxoplasma* therapy. Typically, patients have a subacute presentation of focal neurological signs, with multiple lesions in computed tomography (CT) or magnetic resonance imaging (MRI). However, the neurological and CT scan spectrum is broad. We report a case of toxoplasmic encephalitis in a heterosexual man without prior history of HIV infection. He was admitted with four days of headache, confusion, and new onset of seizures. His brain CT disclosed no alterations and MRI revealed multiple lesions. Empirical specific anti-*Toxoplasma* therapy was initiated and the patient experienced excellent clinical and radiological improvement. His HIV tests were positive and the CD₄⁺ cell count was 74 cells/ml (8.5 %). On follow up, three months later, the general state of the patient was good, without neurological sequelae and with a normal MRI. We concluded that toxoplasmic encephalitis should be considered in the differential diagnosis of meningoencephalitis in sexually active individuals, including cases without prior history or suspicion of HIV infection, and no abnormalities on CT scan.

Key Words: Toxoplasmic encephalitis, computadorized tomography, magnetic resonance imaging, acquired immunodeficiency syndrome.

Toxoplasmosis is a parasitic disease that is prevalent worldwide and the majority of primary cases are asymptomatic. Toxoplasmic encephalitis (TE) is the most common cerebral mass lesion in patient with acquired immunodeficiency syndrome (AIDS) [1], and is due to reactivation of latent infection as a result of progressive loss of cellular immunity. Most patients (>80%) who develop disease have CD₄ cell counts of < 100 cell/mL [2]. The frequency of TE in AIDS patients varies from about one fourth to one half of cases in the absence of antimicrobial prophylaxis [3].

We present a case of TE, as the first diagnosis of opportunistic infection in a patient with human immunodeficiency virus (HIV) infection, with normal brain computed tomography (CT) and multiple lesions on magnetic resonance imaging (MRI).

Case Report

A 49-year-old heterosexual man, without history of intravenous drug use, from Sao Paulo, presented to the hospital with four days of headache, confusion, and new onset of seizures. The patient denied having any other neurological signs or symptoms and any significant medical past history. The findings of a physical examination were grade III right-side hemiparesis with accentuated deep tendon reflexes, and nuchal rigidity. Cranial nerve and ophthalmoscopic examinations were normal. An urgent brain CT (Figure A) scan with and without contrast was normal and eletroencephalogram

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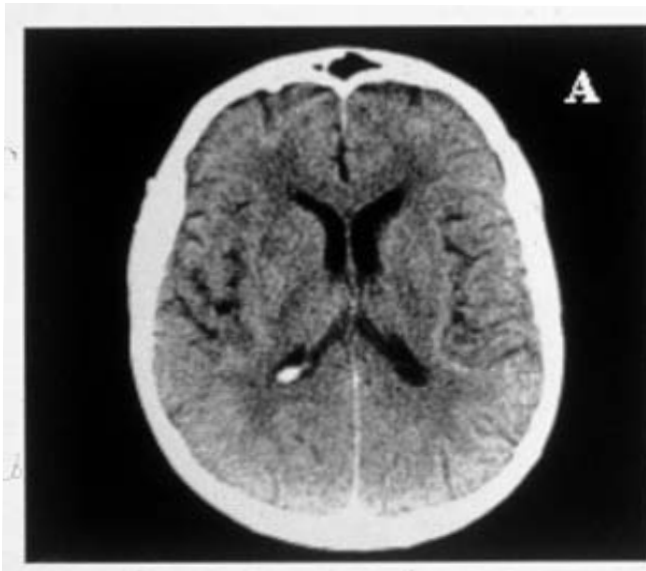


Figure A. CT scan with contrast material enhancement showed no abnormalities

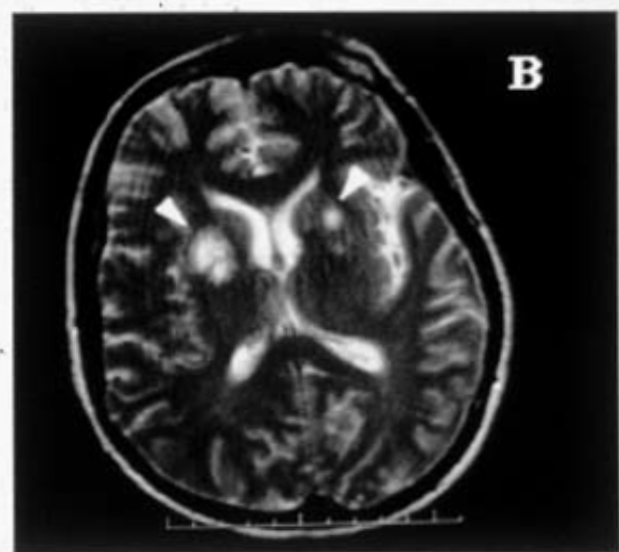


Figure B. Corresponding T2 weighted MRI showed multiple basal ganglia focal lesions, with high-intensity signals (arrows)

disclosed diffuse endocephalitis. Laboratory evaluation showed anemia and lymphocytopenia. A lumbar puncture was performed and the cerebrospinal fluid (CSF) revealed 147 cells/mL (4% neutrophils, 87% lymphocytes, 8% monocytes, 1% eosinophils), a protein level of 108 mg/dL, and a glucose level of 65 mg/dL. Gram stain, culture and latex agglutination for bacteria were all negative. A cerebral MRI (Figure B) demonstrated multiple focal lesions. On the second day of hospitalization he had another seizure and was lethargic and hemiplegic. The patient was transferred to the Intensive Care Unit and empirical treatment for toxoplasmic encephalitis with pyrimetamine, sulfadiazine, and acid folinic was initiated. The results of a serum enzyme-linked immunoabsorbent assay (ELISA) test and Western Blot for HIV were positive. The titres of serum ELISA test for *T. gondii* were high (> 250 UI/mL), and the CD₄⁺ cells count was 74 cells/ml (8.5 %). After two weeks of treatment the patient had complete neurological recovery and partial resolution on MRI.

On follow up, three months later, the general state of the patient was good, without neurological sequelae

and normal MRI. He had 93 cells/mL and was receiving zidovudine, lamivudine, nelfinavir, and secondary prophylaxis for *T. gondii*.

Discussion

The introduction of highly active antiretroviral therapy (HAART) led to decline in the incidence of toxoplasmosis [4] and in toxoplasmosis-associated deaths [5]. However, a recent study [6] showed a lack of change in the distribution of AIDS-defining opportunistic disease, including toxoplasmosis, during the periods before and after the introduction of HAART.

A wide range of clinical findings, including altered mental state, seizures, weakness, cranial nerve disturbances, sensory abnormalities, cerebellar signs, meningismus, movement disorders, and neuropsychiatric manifestations are seen in TE [1-3]. The characteristic presentation usually has a subacute onset with focal neurologic abnormalities. However, in 15% to 25 % of cases, the clinical course may be more abrupt, with seizures or cerebral hemorrhage. Additionally, up 10 % of patients may

present with diffuse encephalitis, without any visible focal lesions [2]. Suspicion of TE in AIDS patients with neurological symptoms usually arises when neuroimaging studies demonstrate multiple lesions, but a solitary lesion may account for nearly one third of patients [7]. Toxoplasmosis frequently affects the basal ganglia, although any portion of the brain may be involved. Even when there are characteristic lesions on CT or MRI scanning, the findings are not pathognomonic. The enhancing ring of toxoplasmosis lesions, when present, may be somewhat thicker and more ill defined than that seen in association with a typical bacterial abscess [8]. TE typically appears on CT and MRI as nodular (small encephalitis) and/or ring-enhancing (large abscess-like lesions) lesions within the brain parenchyma. Nonenhancing lesions on CT have been reported in 6% to 20% of cases [3]. Increased dosages and delayed imaging increases the sensitivity of enhanced CT; however, MRI is more sensitive and will detect small additional lesions in some cases [3]. The finding of normal CT with abnormal MRI is rare, and has been reported in 3% of cases (5 of 164 patients) [9]. One type of image that is highly suggestive of toxoplasmosis abscess is the asymmetric target sign [7], a ring-shaped area of enhancement with a small eccentric nodule along the wall of the enhancing ring, but it is seen in only a small percentage of cases.

The definitive diagnostic criteria of TE requires direct demonstration of the tachyzoite form of the parasite in brain tissue. Presumptive diagnosis is considered in patients with less than 200 CD₄⁺ T-lymphocyte cells/mL, anti-*Toxoplasma* IgG antibody in the serum, consistent clinical features, characteristic neuroimaging studies, and response to empirical anti-*Toxoplasma* therapy [1-3]. Failure to respond to therapy after two weeks, indicated by persistence or worsening of either symptoms or the mass lesions observed on radiographic imaging dictates the need for a diagnostic stereotactic biopsy [10].

TE should be considered on differential diagnosis of cerebral focal lesions or diffuse encephalitis in young and sexually active patients, including cases without prior history or suspicion of HIV infection.

We concluded that TE has broad clinical and

radiological features, complicating an initial diagnostic approach. If left untreated, it is often lethal, and if diagnosis is delayed, neurological sequelae will ensue. Only a high degree of suspicion led to early diagnosis and treatment, and consequently a good outcome.

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