

Cerebral Toxoplasmosis in Aids Patient A Case Report and Review Literature

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Abstract: *Toxoplasmosis is an opportunistic infection commonly affects patient with AIDS. Toxoplasmosis in immunocompromized patient can involve central nervous system and this condition may be fatal. We report a case of cerebral toxoplasmosis in HIV positive patient. MRI revealed multiple mass lesions in right basal ganglia and subcortical area of right temporal lobe with ring like-enhancement. Serology testing revealed positive anti- Toxoplasma gondii IgG. Brain biopsy showed Toxoplasma gondii containing-pseudocyst.*

Keywords: toxoplasmosis, cerebri, HIV, AIDS

1. Introduction

Toxoplasmosis is an opportunistic infection caused by *Toxoplasma gondii*, which can cause a disseminated infection, including in the brain, which can be life threatening in immunocompromized individuals [1-6]. Diagnosis is sometimes not easy in some cases [7].

This report will discuss a case of cerebral toxoplasmosis in HIV-positive patient and underwent brain biopsy, continued with literature review of cerebral toxoplasmosis.

2. Case

A 46 year old man complaint headache which was not improve with medication. Patient also felt weakness on the left side of his body. The patient experient two times seizure during hospitalization. Patient previously had history of herpes labialis.

The physical examination obtained patient's general condition within normal limits, the Glasgow Coma Scale E4M6V5. Neurological examination found isokor pupil, light reflex + / +, no cranial nerve paralysis. There were also white patches on his tongue consistent with oral candidiasis. No palpable enlarged lymph nodes.

CT scan showed isodens mass with irregular edges measuring 2.4 cm x 3.7 cm x 3.4 cm with ring-like perifocal oedema in the right temporal lobe, with midline shift to the left. MRI revealed multiple rounded lesions in the basal ganglia and subcortical area of right temporal lobe with a ring-like enhancement and causing midline deviation to the left. (Figure 1)



Figure 1: CT scan showed mass with irregular border and perifocal oedema (A). MRI showed multiple mass with ring like-enhancement in right basal ganglia and subcortical area of right temporal lobe (B).

Laboratory testing found elevated levels of serum glutamic oxaloacetic transaminase of 70.9 U/L (11.0 to 33.0 U/L) and Serum Glutamic Pyruvic Transaminase 85.9 U/L (11.0 to 50.0 U/L). Complete Blood Count showed lymphocyte count was $0.57 \times 10^3/\mu\text{L}$ ($1-4 \times 10^3/\text{mL}$) and neutrophil count was $7.57 \times 10^3/\mu\text{L}$ ($2.5-7.5 \times 10^3/\text{mL}$). Anti-*Toxoplasma gondii* IgG >650 IU/mL. Rapid HIV testing was positive.

Based on the results of anamnesis, physical examination and laboratory investigation, the patient was clinically diagnosed

as cerebral space occupying lesions with differential diagnosis of cerebral abscess, primary tumor and metastasis.

Brain biopsy was performed. On microscopic examination showed brain parenchyma contain infiltration of lymphocytes, histiocytes and neutrophils. There were foci of pseudocyst containing *Toxoplasma gondii*. (Figure 2)

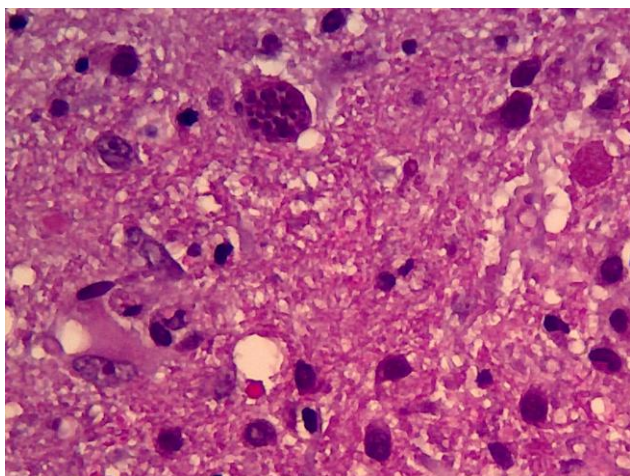


Figure 2: Brain with *Toxoplasma gondii* containing-cyst (Pulasan H-E, 400x)

Based on clinical, radiology, laboratory and histopathologic findings, this case was diagnosed as cerebral toxoplasmosis in AIDS patient. After surgery and therapy of *Toxoplasma gondii*, patient complaint was reduced.

3. Discussion

Toxoplasmosis is a disease caused by *Toxoplasma gondii*, obligate intracellular protozoa. *Toxoplasma gondii* has three forms: tachyzoite, bradyzoite, and sporozoite [1]. Transmission to humans occurs by eating meat containing cysts that are not cooked well, exposure to oocysts contained in vegetables, or direct exposure to cat feces [2,3]. *Toxoplasma gondii* infection in adults usually subclinical [1], but can be a severe infection in immunodeficient patients such as AIDS and malignancy. Toxoplasmosis in these patients occurs due to reactivation of latent infection, not a primary infection [4,5].

Toxoplasmosis occurs in 50-70% of cases of AIDS patients with mass lesions in the brain. Because of HIV infection tend to be more often, the cerebral complication will be more frequent encountered in clinical practice. Studies indicate that approximately 24-74% of AIDS patients with seropositive *Toxoplasma gondii* will develop into toxoplasmosis [3]. Toxoplasmosis encephalitis has association with HIV-positive patients with low CD4+ lymphocyte count (<100/uL) [4].

Clinically, cerebral toxoplasmosis may cause headache, alteration of mental status, and fever. Common focal neurological symptoms are motor weakness, speech disorders, seizures, cranial nerve disorders, visual field defect, sensory disorders, cerebellar dysfunction, meningismus, movement disorders and psychiatric manifestations [5,6]. In this case the patient experienced a headache, motor weakness and seizures.

The diagnosis of cerebral toxoplasmosis is made by clinical, serological, radiological, and histopathologic findings. Patients with brain mass lesion that is accompanied by symptoms that lead to HIV infection such as oral candidiasis and herpes infections, as in this case, can lead us to the diagnosis of cerebral toxoplasmosis. Approximately 97% to 100% of cases of HIV-infected patients with cerebral toxoplasmosis have positive antibodies anti- *Toxoplasma gondii* IgG [3]. In the case of brain mass lesion that have anti- *Toxoplasma gondii* IgG, the patient can be directly given therapy to *Toxoplasma gondii*, without prior diagnosis through histopathological examination from tissue biopsy, followed by monitoring of clinical, laboratory, and radiology [5].

Radiological examination can be done with CT scan or MRI. In CT scan, in 70-80% of patients with cerebral toxoplasmosis can be found low density multiple brain lesions, with ring-like contrast enhancement around the lesion. MRI is the initial screening procedure that is more sensitive to cerebral toxoplasmosis, compared to CT scan. On MRI, the typical radiological features such as multiple lesions with ring enhancement around the lesion. The lesions tend to be located in the basal ganglia and the corticomedulla border of cerebral hemispheres. In only about 14% of cases with solitary lesions. Bleeding can also be found, and this finding can help to differentiate cerebral toxoplasmosis with cerebral lymphoma, another common finding brain mass lesion in HIV/AIDS patient. Sometimes, it can be found a small nodule around eccentric ring (target sign) and this is highly suggestive of toxoplasmosis. Edema around the lesion as well as the mass effect can be seen in various level [5]. In this case, MRI showed multiple mass lesions with ring-like enhancement around the lesion, accompanied with edema and midline deviation.

Microscopic examination of brain tissue biopsy showed tachyzoite or parasite containing-pseudocyst. This finding is a definitive diagnosis of cerebral toxoplasmosis.

Treatment of cerebral toxoplasmosis in AIDS patients has 2 phases, acute and maintenance phase. Acute phase of therapy is given for 6 weeks. The first choice therapy for acute toxoplasmosis in HIV patients is combination of pyrimethamine and sulfadiazine. Because of the combination of these drugs lead to the inhibition of enzymes involved in the synthesis of folic acid, leucovorin administered to prevent bleeding complication [2]. Maintenance therapy is given to prevent relapse. Improvement of immune function with antiretroviral drugs provides better therapeutic results. Kortikosteroids can be given to patients with cerebral edema and intracranial hypertension [6].

Primary prophylaxis should be considered in HIV positive patients with *Toxoplasma gondii* seropositivity who have CD4+ T lymphocytes <100 / uL or <200 / uL with opportunistic infections or malignancies. Trimethoprim-sulfamethoxazole, pyrimethamine-dapsone, and pyrimethamine-sulfadoxine is an effective therapy for this purpose [6].

4. Conclusion

Volume 6 Issue 6, June 2017

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Toxoplasmosis is the most common cause of brain mass lesions in HIV/AIDS patients. Typical MRI result and positive *anti-Toxoplasma gondii IgG* can be used as the basis of empirical treatment of *Toxoplasma gondii*.

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