Case report

Toxoplasmic ventriculitis

Ventriculite toxoplasmique

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1. Introduction

Spontaneous toxoplasmic cerebral ventriculitis alone is a rare and tricky presentation of toxoplasmosis that can be life-threatening. Early diagnosis is therefore crucial. Cerebral toxoplasmosis is one of the most common neurological opportunistic infection in HIV patients. Brain abscesses are frequently observed but they are wrongly thought to be necessary to establish the diagnosis. We report a case of cerebral ventriculitis without any brain abscess.

2. Case report

A 46 year-old Caucasian female patient was admitted to the emergency department of the Pitié-Salpêtrière Hospital in Paris, France, for fever with consciousness disorder and stiff neck. The patient did not present any other neurological sign. Complete blood count was normal. The results of a head CT scan revealed diffuse periventricular subcortical white matter hypodensities. A lumbar puncture was performed and the results revealed 500 cells/µL (90% lymphocytes), protein 2.76 g/L, glucose 1.4 mmol/L (glycemia 5 mmol/L). An amoxicillin, gentamicin, and acyclovir empirical treatment was initiated because of the encephalitis presentation. Convulsions and coma occurred on Day 2. The results of a MRI indicated hydrocephalus, white matter lesions with diffuse T2-weighted and FLAIR hypersignals, and ventriculitis based on supratentorial periventricular enhancement on post-contrast T1-weighted images (Fig. 1). We did not observe any associated parenchymal lesion. Western blot for HIV-1 was positive with a plasma HIV viral load of 5.38 log copies/mL and CD4+ T-lymphocytes count of 240/µL (18% of T-lymphocytes). CSF HIV viral load was 6.2 log copies/mL. IgG for Toxoplasma gondii were positive and IgM negative. T. gondii PCR was positive in CSF. Blood PCRs for cytomegalovirus (CMV), varicella-zoster virus (VZV), herpes simplex virus (HSV), human herpes virus-8 (HHV8), TPHA-VDRL test and interferon-gamma release assay were negative. India ink stain, cryptococcal antigen, acid-fast bacillus stain, bacteriological and fungal cultures, PCRs for CMV, VZV, HSV, HHV8, enteroviruses, and JC-virus were negative in CSF. Epstein-Barr virus and human herpes virus-6 PCR were positive in blood and CSF but with low levels (<3.5 log copies/mL). Flow cytometric immunophenotyping of CSF and blood cells, serum and CSF protein electrophoresis, and CSF

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Fig. 1. Cerebral MRI at diagnosis. A. Diffuse FLAIR white matter hyperintensities and mild hydrocephalus. B. Supratentorial periventricular enhancement on T1 post-gadolinium-weighted images. C. Periventricular hypesignal on diffusion-weighted images. D. Area of restricted diffusion (arrow) on apparent diffusion coefficient maps. E. Low N-acetyl-aspartate (NAA), high lipid peak on short TE (35 ms) spectroscopy. F. High choline, low NAA and persistent high lipid peak on long TE (135 ms) spectroscopy.

IRM cérébrale au diagnostic.

cytological examination were nonspecific. The results of a spine MRI, chest, abdomen, and pelvis CT scan, and broncho-alveolar lavage were normal. Antituberculosis drugs, corticosteroids, and antiretroviral therapy with abacavir, lamivudine, maraviroc, darunavir, ritonavir, and foscarinet were initiated on Day 2. A concomitant administration of sulfamethoxazole-trimethoprim was added to the treatment regimen given the results of the T. gondii PCR and despite the absence of abscess. Gentamicin and acyclovir were discontinued on Day 4. The amoxicillin treatment was administered for 14 days because of presumptive listeriosis.

The patient’s consciousness level improved on Day 14. Diffuse white matter and periventricular enhancement decreased on MRI, and CSF cell count normalized (3/μL). Corticosteroids and antituberculosis drugs were discontinued. The anti-toxoplasma treatment was prolonged until Day 90 when the results of the quantitative T. gondii PCR were negative. HIV viral load was 2.54 and 1.84 log copies/mL in CSF and blood, respectively. The patient’s health status worsened on Day 60. Obstructive hydrocephalus was observed on MRI. Although external ventricular drainage was performed, the patient’s vegetative state and
recurrent status epilepticus led us to only administer palliative care after six months.

3. Discussion

Toxoplasmic meningo-ventriculitis associated with HIV encephalitis was the final diagnosis. Cerebral toxoplasmosis was confirmed by the very specific T. gondii PCR in CSF. Serology was consistent with a reactivation. The diffuse leuocapthy observed on MRI and the higher HIV viral load in CSF than blood (difference of almost 1 log copies/mL) were consistent with HIV encephalitis. Periventricular enhancement alone on MRI is not a specific feature of cerebral toxoplasmosis. On the basis of radiological features, the medical staff considered primary cerebral lymphoma and viral ependymitis (CMV and VZV) diagnoses even though aware that tuberculosis, cysticercosis, and metastatic lesions were also consistent with the radiological results. The diagnoses of primary cerebral lymphoma and viral ependymitis were eventually ruled out based on the normal CSF findings, the multimodal MRI characteristics, and the positive results of the very specific T. gondii PCR. A cerebral biopsy was consequently deemed unnecessary. We used the real-time PCR amplification of the 300-fold repetitive AF146527 gene to detect T. gondii. The authors of a cohort study of Brazilian AIDS patients presenting with cerebral toxoplasmosis observed that the sensitivity of the T. gondii PCR in CSF was only 35.3% [1]. Specificity and positive predictive value, however, were close to 100% [1,2]. This AF146527 assay was demonstrated to have higher sensitivity than the BI real-time PCR and the LC-AF-PCR [2]. Treatment recommendation for conventional toxoplasmic encephalitis is at least six weeks of pyrimethamine and sulfadiazine (or clindamycin). Co-trimoxazole also proved to be effective [3] and its intravenous dosage form is better suited for coma patients. PCR could help decide on treatment duration as it allows for a case-by-case approach.

To our knowledge only 11 toxoplasmic ventriculitis have been reported in AIDS patients so far [4–10]. The following considerations include our patient’s parameters. Diagnosis was made post-mortem for nine patients. Only six received an anti-toxoplasma treatment and clinical improvement was observed in five of them. Median CD4+ T-lymphocytes count was 73/μL (interquartile range [IQR] 30–125). CSF leucocyte count ranged from 67 to 199 (median: 133/μL) without cellular specificity. The results of the biochemistry in CSF revealed a high protein level (3 g/L; IQR 1.65–3.94) and a low glucose level (median: 1.95 mmol/L; IQR 1.64–2.65). Improvement was reported in a few patients but the diagnosis was only based on positive anti-T. gondii IgG and CT results [4]; such results could instead indicate an immune reconstitution inflammatory syndrome (IRIS). Toxoplasmic encephalitis was the sole diagnosis for 7 of 12 patients while syphilis and CMV were observed in the other patients. HIV viral load in CSF was not mentioned for most patients.

Death occurred in 58.3% of patients presenting with toxoplasmic ventriculitis (7/12). Only one survivor did not have any severe neurological impairment. Our case patient highlights the possibility of a poor prognosis despite the administration of an appropriate treatment. Always initiating an empirical anti-Toxoplasma treatment as early as possible could limit neurological impairment in such cases of ventriculitis.

4. Conclusion

An HIV test must always be performed when confronted with nonspecific clinical presentations, especially neurological ones. Cerebral toxoplasmosis must be considered in HIV/AIDS patients with neurological presentation, even in the absence of abscess. Our case patient also highlights the essential role of T. gondii PCR. However, toxoplasmic ventriculitis in AIDS patients is often associated with other diseases that must always be considered.

Authors’ contribution

W. M. wrote the article, performed the statistical analysis, and contributed to reviewing the article.
A. D. contributed to writing and reviewing the article.
D. L. read the cerebral imaging results and contributed to reviewing the article.
J. G., L. P., and C. K. contributed to writing and reviewing the article.
L. E. wrote and contributed to reviewing the article.

Disclosure of interest

The authors declare that they have no competing interest.

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