LETTER TO THE EDITOR

Eosinophilic meningitis caused by *Angiostrongylus cantonensis* mimicking embolic stroke

To the Editor,

Eosinophilic meningitis is an uncommon disease. The aetiologies can be classified as infectious and noninfectious causes. Noninfectious causes include intracranial hardware, medications, and malignancies. Parasitic infection remains the main cause of eosinophilic meningitis, and the rat lung worm (*Angiostrongylus cantonensis*), which is the most common cause, is endemic in Southeast Asia and the Pacific Basin [1].

An 82-year-old woman was admitted for diffuse abdominal pain and generalized painful paresthesias for a week. Her laboratory test results showed leukocytosis (20,400 cells/μL) and eosinophilia (47% eosinophils). She became febrile and comatose rapidly. Computed tomography of the brain showed few faint hypodense lesions in the pons. Magnetic resonance imaging of the brain showed multiple small foci (Figure 1A). The analysis of cerebrospinal fluid (CSF) revealed pleocytosis (1564 leukocytes/μL) with eosinophil predominance (55% eosinophils). Her serum and CSF were sent for enzyme-linked immunosorbent assay, using young adult worm antigen with a molecular weight of 204 kDa, purified by monoclonal antibody, which yielded positive results for both serum (optical density (OD) value = 1.28 at 630 nm; negative control and positive control = 0.18 and 1.33, respectively) and CSF (OD value = 1.41; negative control and positive control = 0.33 and 1.25, respectively) [2].

Her granddaughter recalled that the patient had ingested raw frogs (*Rana plancyi*) 2 weeks previously. After several frogs from the same farmyard were sacrificed, microscopy found some worms (Figures 1B and 1C). For *Angiostrongylus cantonensis* meningoencephalitis, methylprednisolone was given, whereas anthelminthic was not given owing to some concern about the potential inflammatory reaction to dying parasites. Repeated lumbar puncture showed partial improvement of the meningoencephalitis. The patient remained in a stupor after the treatment.

Humans are infected by ingesting these raw intermediate hosts or paratenic hosts, such as snails, prawns, crabs, and frogs. Third-stage larvae migrate to the central nerve system and die, causing meningoencephalitis. Clinical manifestations, such as fever, headache, meningitis, and sensory abnormalities, occur 1–3 weeks later [3]. The diagnosis is typically established by the history of exposure, clinical presentation, and eosinophilia. The findings of brain imaging are mostly nonspecific. Our patient showed multiple small foci (Figure 1A), which were characteristic of acute infarction. These images mimicking embolic stroke may result from the bloodstream spreading of parasites, obstructing intracranial small vessels.

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The treatment options include symptomatic treatment, serial lumbar puncture to relieve headaches caused by increased intracranial pressure, and analgesics with or without corticosteroids. The role of anthelmintic agents remains controversial [1]. Systemic corticosteroids have been shown to provide more rapid symptomatic relief [4]. Angiostrongyliasis is mostly self-limiting, but permanent neurologic sequelae may occur in some cases [5]. Our patient remained in a stupor after a 4-week course of corticosteroid treatment.

Our case demonstrates that angiostrongyliasis is not always as benign as generally perceived. Rapid decline in consciousness level and multiple foci on brain magnetic resonance imaging might be indicators for poor neurological outcome. Clinicians should be aware of parasitic infection in patients with eosinophilia, especially those with a history of ingesting raw food in endemic areas.

Conflicts of interest: All authors declare no conflicts of interest.

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Figure 1. (A) Magnetic resonance imaging (MRI) of the brain revealed multiple small foci (arrows) of high signal intensity on T2-weighted fluid attenuated inversion recovery (T2 FLAIR) image, diffusion weighted imaging [DWI; repetition time (TR) = 8000 milliseconds, echo time (TE) = 71.7 milliseconds, $b = 1000$], and exponential apparent diffusion coefficient mapping (EADC) and low signal intensity on apparent diffusion coefficient mapping (ADC) in bilateral cerebellar hemispheres, bilateral frontal and parietal lobes (mainly at cortical—white matter junction), and left caudate nucleus. No significant enhancement was noted after gadolinium administration (not shown). (B, C) After the frogs were sacrificed and digested in pepsin—hydrochloride solution for few hours, 96 third-stage larvae of *Angiostrongylus cantonensis* were recovered [original magnification, ×10 Obj. (B) and ×40 Obj. (C)]. The terminal projection on the tip of the tail (the termination of the tail at a fine point) and two eye spots at the knoblike anterior end are characteristic of *A. cantonensis*. 
References


