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Case Report

A rare case of eosinophilic meningitis

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ABSTRACT

Eosinophilic meningitis is a rare form of meningitis, usually caused by helminthic infection and the most common agent is *Angiostrongylus cantonensis*. It has a variable clinical presentation that ranges from cranial nerve abnormalities, ataxia, meningitis, encephalitis and rarely death. As the literature and reviews on this topic are rare, the standard treatment for eosinophilic meningitis caused by *A. cantonensis* infection has always been controversial. There is evidence that a 2-week course of high dose corticosteroid along with albendazole have helped in management. Here we discuss the case of a toddler with eosinophilic meningitis with *Angiostrongylus* species.

Keywords: Eosinophilic meningitis, Toddler, Angiostrongylus

INTRODUCTION

Cerebrospinal fluid (CSF) does not normally contain eosinophils and the presence of at least 10% eosinophils in total CSF leukocyte count or more than 10 eosinophils/µL in CSF confirms eosinophilic meningitis.[1]

Eosinophilic meneingitis can be caused by infectious, non-infectious and other rare causes. Infectious causes can be parasitic or non-parasitic. Parasitic etiologies of eosinophilic meningitis include angiostrongyliasis, gnathostomiasis, and baylisascariasis. Non-parasitic infectious etiologies include coccidioidomycosis, cryptococcosis.

Noninfectious etiologies of eosinophilic meningitis include hematologic disorders, neoplastic diseases, usually Hodgkin lymphoma, hemorrhagic cerebrovascular syndromes, mechanical shunt malfunction, adverse drug reactions etc.

Other rare causes of eosinophilic meningitis are sarcoidosis, cerebral eosinophilic granuloma, amyloid-beta related angiitis, eosinophilic granulomatosis.

Parasitic infection is usually acquired by eating raw or undercooked snails or slugs infected with the parasite, which then migrate to the brain and rarely to the lungs, resulting in clinical manifestations.

CASE REPORT

10-month-old boy presented to us with complaints of low-grade fever and multiple episodes of vomiting of 2 days duration, for which he received iv antibiotics before presenting to us. Evaluation revealed irritable and drowsy child with bulging anterior fontanelle and other systemic examination were unremarkable. Child is developmentally normal with no past hospital admission. Immunization is appropriate for age. History revealed rodents at home with thick foliage around residence. He was admitted with provisional diagnosis of partially treated pyogenic meningitis. His initial blood investigations revealed anaemia (Hb-7.6 gm%) with neutrophilic leucocytosis and eosinophilia. Lumbar puncture done revealed CSF pleocytosis with eosinophilia. CSF gram stain, culture and sensitivity, calcofluor white, India ink and viral studies came out to be negative. Stool sample sent for ova; cyst was also

negative. He was managed with IV meropenem and vancomycin along with steroids (2 days) and other supportive measures. MRI and EEG done were normal. Repeat lumbar puncture done also showed CSF pleocytosis with eosinophilia. In view of CSF eosinophilia with peripheral eosinophila and anaemia, bone marrow was done and possibility of acute leukemia was ruled out. As other causes of eosinophilic meningitis were ruled out, the possibility of parasitic eosinophilic meningitis was entertained. CSF PCR for *Angylostrongylus* spp. came out to be positive. Child was started on oral steroids (2 mg/kg/day) and albendazole (15 mg/kg/day) for 2 weeks. Child clinically improved within 2 days and repeat blood counts were normal with no eosinophilia.

Table 1: Biochemical and cytologic analysis of the patient's CSF.

Date	TC	DC	Protein	Sugar
09/11/2022	320	P5 L70 E25	56	64
15/11/2022	980	P5 L60 E35	67	44

Table 2: Haematological analysis.

Date	Total count	Differential count
08/11/2022	14,300	P55 l33 e08 m03
15/11/2022	13,100	P34 l41 e20 m05
22/11/2022	9,300	P53 l38 e02 m07

DISCUSSION

Meningoencephalitis due to *Angiostrongylus cantonensis* is unusual in the pediatric age group.

Transmission of this organism is between snails, slugs and rodents. Humans acquire them through consumption of infected snails or rodents, so humans are the incidental hosts. The incubation period ranges between one to three weeks.[1]

Clinical manifestations

Neurologic symptoms are more manifested as the worms migrate and infect the human brain mostly. The most common presentation is meningitis. Neck stiffness, nausea and vomiting are common. Other symptoms involving the brain, spinal cord and nerve roots can also be seen within 2-35 days following infection.[2]

Opening CSF pressures are often elevated. In 4 to 9% of the patients, paralysis of the extraocular muscles or facial nerves may develop, but it is self-limiting. The mortality rate is usually less than 0.5%.[3]

Diagnosis[4]

It is made based upon the clinical presentation, positive epidemiologic history suggesting known or possible exposure to *A. cantonensis* and positive lab finding (presence of CSF eosinophilia).

CSF findings-CSF eosinophilia with elevated protein and normal or reduced glucose levels. CSF PCR can be done to detect DNA of the parasite. Other test include Enzyme-linked immunosorbent assay (ELISA). Peripheral eosinophilia, radiographic studies computed tomography (CT) is usually non-contributory.

Magnetic resonance imaging (MRI) may demonstrate ventriculomegaly, leptomeningeal enhancement, and punctate areas of abnormal enhancement within the cerebellar and cerebral hemisphere on gadolinium-enhancing T1 imaging, high signal intensities over the globus pallidus and cerebral peduncle on T1-weighted imaging, and a hyperintense signal on T2-weighted images.[5-7]

Treatment

The standard treatment has always been controversial.[8] It is usually treated with albendazole. Combined therapy with albendazole and dexamethasone has also been shown to be effective.

Surgery or laser therapy can be considered in case of an occular manifestation.[9]

Analgesics, corticosteroids, and periodic removal of CSF can relieve symptoms due to elevated intracranial pressure.[10]

CONCLUSION

This case report is to increase the awareness of eosinophilic meningitis in our society and the most common among them being due to *Angiostrongylus* spp.

Even though, the organism cannot be isolated, starting an empirical treatment with albendazole along with corticosteroids can be considered in all patients presenting with peripheral and CSF eosinophilia with signs of meningeal irritation.

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REFERENCES

1. Weller PF, Ryan ET. Eosinophilic Meningitis. Available at: https://www.uptodate.com/contents/eosinophilic-meningitis. Accessed on 12 March, 2023.
2. Liu WL. Eosinophilic meningitis. Semin Neurol. 1993;13:161-8.
3. Centers for Disease Control and Prevention. Parasites-Angiostrongyliasis (also known as *Angiostrongylus* Infection): Disease. Available at:

https://www.cdc.gov/parasites/angiostrongylus/disease.html. Accessed on February 13, 2023.
4. Punyagupta S, Juttijudata P, Bunnag T. Eosinophilic meningitis in Thailand. Clinical studies of 484 typical cases probably caused by *Angiostrongylus cantonensis*. Am J Trop Med Hyg. 1975;24:921.
5. Yang B, Yang L, Chen Y, Lu G. Magnetic resonance imaging findings and clinical manifestations in cerebral angiostrongyliasis from Dali, China. Brain Behav. 2019;9:e01361.
6. Tsai HC, Liu YC, Kunin CM. Eosinophilic meningitis caused by *Angiostrongylus cantonensis* associated with eating raw snails: correlation of brain magnetic resonance imaging scans with clinical findings. Am J Trop Med Hyg. 2003;68:281.
7. Jin E, Ma D, Liang Y. MRI findings of eosinophilic myelomeningoencephalitis due to *Angiostrongylus cantonensis*. Clin Radiol. 2005;60:242.
8. Graeff-Teixeira C, da Silva ACA, Yoshimura K. Update on eosinophilic meningoencephalitis and its clinical relevance. Clin Microbiol Rev. 2009;22(2):322-48.
9. Sawanyawisuth K, Sawanyawisuth K. Treatment of angiostrongyliasis. Trans R Soc Trop Med Hyg. 2008;102:990.
10. Thanaviratananich S, Thanaviratananich S, Ngamjarus C. Corticosteroids for parasitic eosinophilic meningitis. Cochrane Database Syst Rev. 2015;CD009088.

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