Case Report

Eosinophilic Meningitis and Intracranial Haemorrhage: Can it be Neuro-Gnathostomiasis ?

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Abstract

Peripheral eosinophilia is commonly encountered in our clinical practice. In this case report, we present a child who presented with hemorrhagic stroke and was finally diagnosed of eosinophilic meningitis. In this case report, we also propose probable etiologic agent.

Introduction

Eosinophilic meningitis (EM) is an uncommon diagnosis in a child presenting with cerebral parenchymal haemorrhage. EM is defined as the presence of 10 eosinophils/mL in CSF or at least 10% eosinophils in the total CSF leukocyte count based on the studies done in the past[1].Physician's unawareness of clinical symptoms, absence of signs of meningeal irritation and failure of laboratory tests to identify eosinophilia in CSF makes the diagnosis of eosinophilic meningitis challenging[2]. The presence of eosinophils in CSF suggests number of infectious and non-infectious etiologies[3]. In a previously healthy child, the commonest causes of eosinophilic meningitis are neuro-parasitesangiostrongyliasis (rat lung worm) and gnathostomiasis worldwide[4]

The Case

Twelve years old boy from Dolakha, Nepal presented with sudden onset of weakness of left upper and lower limb for one day which was preceded by severe headache. There was no vomiting, loss of consciousness, any abnormal body movements or history suggestive of cranial nerve involvement. He was developmentally normal child without any significant illnesses in the past. On arrival, his vital signs were normal. His higher mental function and cranial nerve examination was normal. He had decreased tone in left upper and lower limbs with power of 2/5 on all groups of muscles of left upper limb and 1/5 on all group of muscles on the left lower limb. Reflexes were brisk with extensor plantar on left side. Motor examination of right side was normal. His sensory examination, cerebellar examinations were normal. There was no sign of meningeal irritation and other systemic examination were normal.

His CT scan revealed haemorrhage in right frontal region (Figure 1). His haemoglobin was 12 gm%. PT:14, INR:1.16 (Control:12), APTT: 30 (Control: 30) and CT angiography was normal. The power of both limbs gradually improved over next few days but suddenly on 10th day of hospital admission, he again developed headache and

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multiple episodes of vomiting without signs of meningeal irritation. He was managed with mannitol and 3% Normal Saline. His WBC: 11,330/cumm with (N:50% L:22% and E:28%) with absolute eosinophilia count (AEC): 2847cu/mm so Cerebrospinal fluid analysis(CSF) was done which analysis revealed Total Cells: of 210 cells/ mm^3 with 90% Monomorphs and 10% Polymorphs, Sugar: 55 mg/dl, Protein: 58 mg/dl, RBC:500 /mm^3. CSF Eosinophil was 40 %.

On further review of history, it was also found that he ate raw fish caught at the nearby river frequently. There was also history of abdominal wall swelling a month back which resolved by itself. His stool examination revealed eggs of Trichuristrichuria and hookworm. He was treated with prednisolone followed by three week course of Albendazole, Ivermectin and Praziquantel. Physiotherapy was given and discharged home after 16days. On follow up he completely improved.

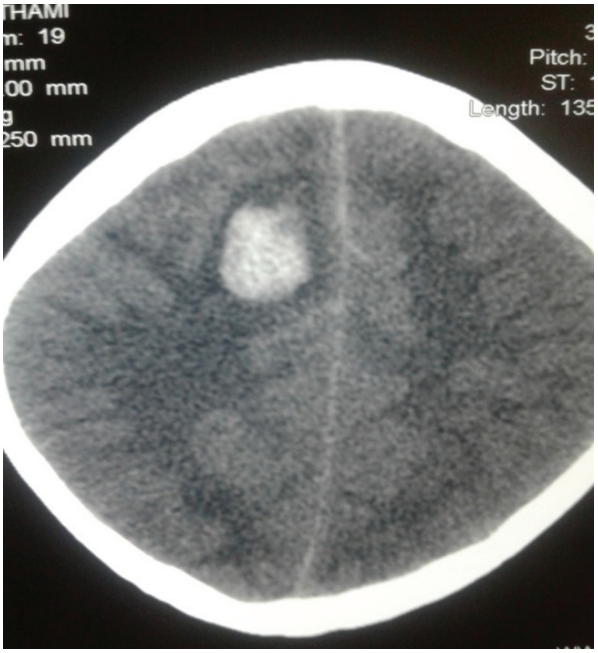

Fig 1: CT scan showing intracerebral haemorrhage in right frontal lobe

Discussion

Though there are few case series of parasitic infestation in Nepal[5,6] neurological manifestation of parasitic infestation had not been described in any of these reports. Though there are few studies on peripheral eosinophilia and acute encephalitis syndrome from Nepal, none of these include or report cases of eosinophilic meningitis. Thus, to our knowledge this is a first reported case of eosinophilic meningitis from Nepal.

The recurrence of symptoms in presence of peripheral eosinophilia makes us suspect eosinophilic meningitis in our patient so CSF analysis was done in spite of absence of signs of meningeal irritation. Eosinophils can be distorted or destroyed during CSF processing and can be mistaken for neutrophils if CSF analysis is automated[7] Therefore, if there is a suspicion for eosinophilic meningitis, the sample should be properly stained with Wright or Giemsa staining and should be manually read. He was a previously healthy child with no risk factor or pointer towards a non-parasitic cause of eosinophilic meningitis. (Immunodeficiency, exposure to drugs, contact with or evidence of tuberculosis) so the parasitic infestation was considered to be the cause for this EM. *Angiostrongylus spp.* infection is usually seen as self-limited eosinophilic meningitis and only rarely causes severe disease with prominent spinal or cerebral involvement[8] which makes this diagnosis unlikely in our patient. A history of consumption of raw freshwater fish, intracranial haemorrhage (ICH) on neuroimaging and Eosinophilic meningitis (EM) would suggest the diagnosis of neuro-gnathostomiasis if immunodiagnostic testing is not available[9,10].

Cutaneous gnathostomiasis is the most common manifestation of infection. The self-resolving abdominal wall swelling in our patient probably was cutaneous gnathostomiasis. The clinical symptoms of neuro-gnathostomiasis are related to mechanical disruption by larvae migration in CNS,[11] relapse may occur and progression of symptomatology may not cease if larvae are not killed by anthelminthic agents[12]. Hence we treated our patient with anthelminthic and steroid to alleviate risk of increasing cerebral oedema due to dying neuro-parasites. Although steroids have also been used to relieve perifocal oedema, no well-controlled studies have shown proven efficacy[2,13].

In the systemic review done by Devleesschauwe Brecht et al[14] on parasitic zoonosis in Nepal, only *Angiostrongyluscantonensis* was detected. However, *G. spinigerum*infection is endemic in Southeast Asia, particularly in Thailand and Taiwan[15,16,17]. Since, Nepal also share similar geographic location and human behaviour of eating uncooked animal food make us suspect that this parasite must be prevalent in our part too. The prevalence of this parasite in our part need to be further researched.

Conclusion

We proposed gnathostoma species for eosinophilic meningitis and intracranial haemorrhage. We also highlighted the diagnostic challenges for eosinophilic meningitis and neuro-gnathostomiasis. This case also highlighted the probable existence of neuro-parasites except neuro-cysticercosis in our part of the globe

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