

Case Report

A Rare Case of Amoebic Meningoencephalitis

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Abstract

Free-living amebas are protozoan environmental parasites, mainly in freshwater, lakes, and rivers, without needing a definitive host.¹ In humans, there are four main genera of amebas that can cause disease, namely *Naegleria* (only *Naegleria fowleri*), *Acanthamoeba* (several species). A 32 years old male came with complaints of fever, altered sensorium, vomitings for 1 day and presented with involuntary movements of all four limbs. On presentation Blood pressure was 160/100 mm of Hg, pulse rate- 107 bpm, RR-36 cpm and was intubated in view of low GCS. The patient was initiated on intravenous Amphitericin B and dose was determined using body weight, and was changed to tab fluconazole and tab azithromycin in view of acute kidney injury after 9 days of administration. Patient survived with residual neurological deficits.

INTRODUCTION

Free-living amebas are protozoan environmental parasites, mainly in freshwater, lakes, and rivers, without needing a definitive host.¹ In humans, there are four main genera of amebas that can cause disease, namely *Naegleria* (only *Naegleria fowleri*), *Acanthamoeba* (several species), *Sappinia* (only *S. pedata*), and *Balamuthia* (only *Balamuthia mandrillaris*).² The amebas have a propensity to cause central nervous system (CNS) infections, but *Acanthamoeba* is well-known to cause keratitis and disseminated infections as well.^{1,3}

These free-living amebas can cause 2 distinct clinical syndromes, primary amebic meningoencephalitis (PAM) and granulomatous amebic encephalitis (GAE). The initial symptoms of PAM are indistinguishable from bacterial meningitis, while the symptoms of GAE can mimic a brain abscess, encephalitis, or meningitis. These infections are almost uniformly fatal. The mortality rate is above 90%, despite antimicrobial therapy.⁴

CASE DESCRIPTION

A 32 years old male came with complaints of fever, altered sensorium, vomitings for 1 day and presented with involuntary movements of all four limbs. On presentation Blood pressure was 160/100 mm of Hg, pulse rate- 107 bpm, RR-36 cpm and was intubated in view of low GCS. MRI Brain was done which shows features suggestive of meningoencephalitis. Patient had history of swimming in nearby river for past six months. CSF wet mount shows *Naegleria fowleri* and cysts of *acanthamoeba*. The patient was initiated on intravenous Amphitericin B and dose was determined using body weight, and was changed to tab fluconazole and tab azithromycin in view of acute kidney injury after 9 days of administration. Patient's consciousness begins to improve from day 10 of admission but was not oriented. Patient weaned off from ventilator and was discharged after 36 days of hospital stay. Patient was brought for review after 2 weeks and was conscious and oriented and had vision and hearing loss. On evaluation patient had optic atrophy and sensorineural hearing loss and repeat MRI brain showed persistent pachymeningeal enhancement.

Acanthamoeba cysts



Naegleria fowleri



N. fowleri is one of several species in the genus *Naegleria* and the only one known to produce human disease.^{5,6} This form of nervous system infection by amoeba was first documented in Australia in 1965. *N. fowleri* trophozoites are motile and move by extending a blunt lobopodium (pseudopodium) and destroy tissue with which they come into contact. Trophozoites replicate by binary fission. When the *N. fowleri* trophozoites are exposed to a change in ionic concentration, such as placement in distilled water, they transform into biflagellates or multiflagellates. Trophozoites encyst in response to unfavorable conditions.⁷ Most *N. fowleri* infections have occurred in children and young adults in summers that have had recent exposure to swimming or diving in warm fresh water. The symptoms of PAM are indistinguishable from acute bacterial meningitis. The illness begins suddenly with the abrupt onset of fever, headache, nausea, and vomiting. Altered mental status occurs in about two third of patients and is followed by rapid deterioration to coma and death.⁸

Diagnosis is based on the patient's history and examination of the CSF. The CSF glucose level may be low or within the reference range, but the protein is usually elevated. CSF gram stain is negative for bacteria. CSF wet mount is positive for motile trophozoites and is of paramount importance for the diagnosis. Additional methods of diagnosing *N. fowleri* infection include polymerase chain reaction (PCR), monoclonal antibodies, DNA probes, and isoenzyme profile analysis. Limited data are available on imaging studies. Amphotericin-B (intrathecal and intravenous) is the drug of choice. The patients may benefit from Rifampicin and Tetracycline. Sometimes Metronidazole and Ornidazole are also added for better results.⁸

On the contrary, *Acanthamoeba* exists in only two forms, cysts and trophozoites. The trophozoites are the infective forms. Both *Acanthamoeba* spp. cysts and trophozoites are found in

tissue.³ Rarely, *Acanthamoeba* trophozoites may be seen on the Giemsa stain of the CSF sediment. Head computed tomography scanning or magnetic resonance imaging (MRI) should precede lumbar puncture if clinical signs of focal central nervous system involvement or elevated intracranial pressure are present. MRI of the brain shows the presence of single or multiple space-occupying lesions with ring enhancement. Computed tomography may show progressive hydrocephalus, meningeal thickening, pseudotumoral lesions, largely isolated lesions, or multifocal ring-enhancing lesions. On post-mortem examination, significant edema and hemorrhage of the brain are seen. Multiple other regimens are also recommended. Chronic *Acanthamoeba* meningitis was successfully treated in 2 children with a combination of oral trimethoprim/sulfamethoxazole, rifampin, and ketoconazole. Resection of brain lesions may help as well.^{9,10,11}

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