# Primary Amebic Meningoencephalitis Caused by *Acanthameba:* SuccessfullyTreated with Cotrimoxazole

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Amebic meningoencephalitis is a rare, usually fatal infection, occurring primarily in children and immuno-compromized individuals. Two dinstinct syndromes namely, primary amebic meningoencephalitis(PAM) caused by *Negleria* and granulomatous amebic encephalitis (GAE) caused by *Acanthameba* are well recognized. However, *Acanthameba* has also been implicated in occasional cases presenting as PAM. To date, around 150 cases of PAM and 40 cases of GAE have been reported(1,2).

*Acanthameba* infections are highly resistant to chemotherapeutic agents; varying but mostly disappointing clinical results have been reported. We report an interesting case, primarily having meningitis caused by *Acanthameba*. The child had little evidence of involvement of brain parenchyma either clinically or radiologically and was successfully managed with intravenous cotrimoxazole.

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## Cases Report

A twelve-year-old girl presented with high grade intermittent fever, vomiting and headache for last one and half months. She had also been complaining of a stiff neck for the past one month. There was no history of trauma, convulsions, altered sensorium, ear discharge, repeated infections, chronic illness or tubercular contact. The child had been administered medication during this period but the details were not available. A lumbar puncture was also performed two weeks earlier which was reported as being apparently normal. On examination, the child was well nourished, conscious though irritable, toxic and febrile. She had signs of meningeal irritation and brisk tendon reflexes. Her vitals were stable and fundoscopy did not reveal any signs of raised intracranial tension. Rest of the systemic and neurological examination was normal.

Investigations revealed a normal leucocytic profile, normal peripheral smear and absence of any hemoparasites. Turbid CSF was obtained on doing a lumbar puncture which showed 700 cells/$mm^3$, all polymorphs with proteins 95 mg/dl and sugar 40 mg per/dl. Gram stain failed to reveal any organism. A presumptive diagnosis of pyogenic meningitis (partially treated) was kept and treatment was started with intravenous penicillin (4 lac units/kg/day) and cefotaxime (150 mg/kg/day). After starting the therapy, the child showed clinical improvement as the fever subsided and meningeal signs disappeared. After 14 days, lumbar puncture was repeated, which surprisingly showed little change. The fluid remained turbid, total cell count was 300/$mm^3$, all polymorphs with proteins and sugar of 65 and 45 mg/dl, respectively. Gram stain was again negative. Both fungal and bacterial cultures from CSF failed to show any growth. As the child had improved clinically, same

management was continued. But the child deteriorated thereafter and started vomiting on 16th day followed by onset of continuous high grade fever from 18th day onwards. Signs of meningeal irritation also reappeared. CSF was obtained once again and this time some abnormal motile cells could be identified. CSF was immediately rushed to the microbiological laboratory where it was examined under bright field microscope after slow centrifugation. It revealed motile trophozoites of *Acanthameba* numbering 50/mm$^3$ along with CSF pleocytosis. Subsequently, *Acanthameba* were cultured from CSF plated on nutrient agar seeded with *E. coli* (*Fig. 1*) CT scan of head and *X*-ray of chest were normal.

After establishing the diagnosis of amebic meningitis, therapy was instituted with intravenous cotrimoxazole (10 mg/kg/day of trimethoprim in two divided doses). Ten days after starting this therapy, vomiting, headache and meningeal signs subsided and the child became afebrile by the end of 2nd week. However, CSF continued to show presence of amoebae till one month after starting treatment with cotrimoxazole, though their number continued to decline in each subsequent lumbar puncture done at weekly intervals. CSF normalized completely by 6th week of starting this drug. At this stage intravenous cotrimaxazole was replaced by its oral preparation and continued for next two weeks. No side effects of the drug were noticed. The child was followed up for one year after stopping therapy and was enjoying good health.

## Discussion

*Acanthameba* and *Negleria* exist as small, free living coprozoic organisms with a trophozoite as well as a cyst form. Trophozoites are characterized by single nucleus with large karyosome and contractile vacuoles. *Acanthameba* trophozoite is less motile and instead of forming broad lobopodia (as an *Negleria*), forms spiny or filose pseudopods called acanthopodia(3).

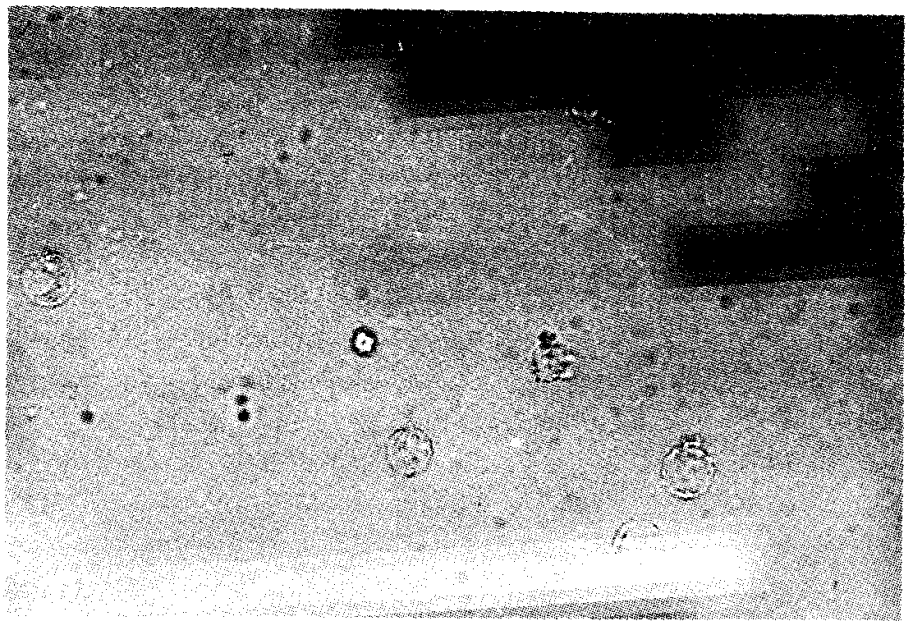

*Fig. 1. Acanthameba obtained from CSF culture on nutrient agar.*

Amebas feed on bacteria such as *E. coli* and enterobacter. Although water, dust and soil have been identified as sources of infection in a few patients; by and large the source has remained untraceable. Cases of GAE caused by *Acanthameba* usually occur in chronically ill and debilitated patients with impaired host-immune responsiveness. But instances of meningoencephalitis occurring due to *Acanthameba* have been described (like the present case), where no demonstrable underlying disease or predisposing factor could be identified(4).

In the case presented above, onset was insidiuous and the course of illness prolonged. *Acanthameba*, due to their relatively slow rate of growth are known to cause disease with prolonged incubation period and chronic course(2). Involvement of central nervous system by *Acanthameba* usually results in GAE, a syndrome indistinguishable clinically from minor brain stem encephalitis or space occupying lesion. The element of meningeal involvement is limited and CSF shows lymphocytic predominance(5,6). However, our case was uniquely characterized by its primary meningeal involvement without any seizures, focal deficits, altered sensorium or granulomatous lesions in the central nervous system. CSF exhibited a polymorphonuclear response. This type of presentation, usually seen in *Negleria* is rather uncommon with *Acanthameba* infestation. As we were not able to identify the species involved, one can only speculate whether this was a rare presentation of a known species or common presentation of some unknown species of *Acanthameba*.

Various therapeutic agents have been tried for treating *Acanthameba* infections but without any consistently gratifying results. Amphotericin B, miconazole and rifampin given for PAM are ineffective in *Acanthameba* infections(7). Various potentially effective agents for *Acanthameba* include colistin, ketoconazole, mefloquine, pyrimethamine and primaquine(1). Carter *et al.* suggest the use of sulfadiazine(200 mg/kg/day) plus flucytosine (150 mg/kg/day) for GAE(8). We used intravenous cotrimoxazole because of non-availability of intravenous preparation of sulphadiazine. Sulphamethoxazole, the active sulfa ingredient of cotrimoxazole, can reach a CSF concentration upto 80% of that in the blood(9). The drug proved successful in our case; only it had to be given for a prolonged period of 8 weeks. However, more extensive clinical trials are needed before cotrimoxazole can be recommended for routine use in *Acanthameba* infections of the central nervous system.

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# Wichman Syndrome Simulating Posterior Fossa Mass in CT Scan

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Congential cerebeller hypoplasia as an autosomal recessively inherited disorder has been reported by Wichman *et al.*(1). This syndrome comprises of gait ataxia, hypotonia, mental retardation, cerebellar hypoplasia, ventricular dilatation and vermis anomalies. Three sibling pairs with abnormalities in CT Scan ranging from prominant valleculla to enlarged cisterna magna with hypoplasia of cerebellar hemispheres and vermis have been reported, the pedigrees were consistent with autosomal recessive inheritance(1). Seven more children with congenitally small cerebella have also been reported as isolated cases described to be sporadic, nonprogressive malformations of the brain(2).

We present here an isolated case undetected till the age of 9 years with similar features. However, the point to be kept in mind is the glaring disparity between the CT Scan and MRI findings.

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## Case Report

A 9-year-old female, presented with staggering gait drifting to the left from early childhood. There was history of occasional episodes of vomiting, headache and vertigo since 6 years of age, each episode lasting for 2-3 days. Two recent attacks were preceded by fever, malaise, watering and redness of eyes. There was no history of seizures, altered sensorium, visual disturbances of deafness. Speech, swallowing and chewing were unaffected. Scholastic performance was