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PRIMARY AMEBIC MENINGOENCEPHALITIS IN PREGNANCY: A RARE CASE REPORT OF NAEGLERIA FOWLERI INFECTION

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Abstract

Background: *Primary amebic meningoencephalitis (PAM) is a rare, rapidly progressive and highly fatal infection of the central nervous system caused by Naegleria fowleri.*

Case Presentation: *A 32-year-old woman at 32 weeks gestation presented with fever, headache, vomiting and later neurological deterioration. PCR confirmed Naegleria fowleri infection.*

Conclusion: *PAM should be considered in rapidly progressive meningoencephalitis even in the absence of swimming exposure.*

Introduction

Primary amebic meningoencephalitis (PMA) is a rare and fatal central nervous system infection caused by a free living, thermophilic amoeba—*Naegleria Fowleri* (1).It exists as motile infective trophozoites, a transitory flagellate form and environmentally hard cysts. The habitat of the organism is fresh water reservoirs like rivers, ponds, lakes, un-chlorinated swimming pools. As it is a thermophilic organism so its proliferation increases during summer season. It gains access into the central nervous system by the nasal cavity which may occur during swimming, washing face. Once in the nasal cavity it pierces the cribriform plate and enters the brain, causing granulomatous inflammation, which is rapidly progressive and fatal (2).

PAM was initially reported in Australia in 1965; since then, it has been reported in more than 16 countries. We are reporting here a case of Naegleria infection in a pregnant lady. However, approximately 440 cases of Naegleria have been reported worldwide (3). but we failed to find a case of Naegleria in pregnant patient.

Case Report

In August 2014, a 32 year old lady presented to the emergency department of the Aga Khan University Hospital Karachi with complaints of low grade fever, headache and vomiting for one day, at 32 weeks of pregnancy. She was G3 P2+0, and had no co-morbids. Symptomatic treatment was given and admission was offered for evaluation but left against medical advice. Two days later, she presented with complaints of altered sensorium for one day, and fever, vomiting, head ache & neck stiffness for three days. She had no history of swimming or travel. However she used tap water for ablution.

She was drowsy and signs of meningeal irritation were elicited. Her BP was 113 / 65mmHg, pulse was 98bpm and was afebrile. She was maintaining oxygen saturation at room air with normal arterial blood gas examination. Her cardiovascular examination was unremarkable however had harsh vesicular breathing on auscultation. Abdominal examination showed fundal height corresponding to dates and fetal heart sound were present. She was electively intubated and admitted to the critical care unit with provisional diagnosis of meningo-encephalitis, pre-eclampsia and cerebral venous sinus thrombosis. Multidisciplinary team including intensivist, neurologist, infectious diseases specialist and obstetrician were involved. Lumbar puncture was performed and cerebrospinal fluid (CSF) was sent for

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investigations. Primary amebic meningo-encephalitis protocol was started in strong suspicion of Naegleria.

CT scan brain showed cerebral edema, diffuse meningeal enhancement and mild non enhancing low attenuation areas in both frontal lobes more marked on left side, likely representing underlying ischemia, and the findings were suggestive of meningo-encephalitis.

Laboratory investigations showed hemoglobin of 10.6g/dl, total leucocyte count 22.3x109/L, Neutrophils 86%, Platelet count 143, 000. Hepatitis A and E was non- reactive. Troponin I was negative. Urine and blood culture showed no growth. CSF smear for acid fast Bacilli was negative and wet mount was negative for Naegleria. CSF DR showed reduced glucose 36, increased protein 358, Lecocytosis $913x10^9$/L, neutrophils 70% but cultures did not show any growth but CSF PCR showed *Naegleria Fowleri*. She was kept on full inotropic support but her clinical condition deteriorated. Fetal assessment revealed fetal bradycardia and oligohydramnios. In view of poor prognosis of baby, it was decided mutually by family and physicians not to opt for delivery.

Hypothermia treatment was started and she was kept on maximum inotropic support. Ventilator support was withdrawn on day four of admission and death was declared.

Discussion

Nagleria fowleri is the causative free living ameba of PMA, which is a fatal central nervous system infection. The number of reported cases has incased worldwide in recent years since Naegleia Fowleri was first recognized in 1965 (4).

PAM usually occurs in previously healthy individuals who have exposure to warm fresh water by swimming or otherwise. In addition, the changes in environmental conditions, polluted water from industry and the development of nuclear power plants allow greater growth of ameba and opportunities for infection. Indeed recreational areas such as water parks, lakes and pools are not properly maintained and adds to increase rate of growth of ameba (5).

It gains entry in human body through nose during swimming or rinsing nose deeply. It pierces the cribriform plate and reaches the brain following the olfactory nerve pathway. The trophozoites destroy the brain tissue leading to neurological deficit and ultimately death in a period of 3-7 days (6).

.Our patient was in perfect state of health and had no history of swimming, the only source could be rinsing of nose with tap water for ablution.

Shakoor et al, suggested that ablution with tap water could be the only cause of transmission of infection to brain, especially if there is no history of swimming. Rise in global temperatures, improperly chlorinated water and deteriorating water distribution system are the other causes of proliferation of N fowleri (5).

PAM due to Naegleria Fowleri has a worldwide distribution and occurs most frequently in topical areas and during summer months (2).

The mortality rate is high probably exceeding 98% (7). August in Karachi is warm and supply of inadequately chlorinated water could be the cause of infection in our patient.

Ongoing pharmacological research against N fowleri failed to show promising results and only some showed limited activity against it (3) and only eight cases are reported to be cured in literature so far (8)

Triple drug regime of intravenous amphotericin B, Fluconazole and oral Rifampicin has successful results in few PAM patients (9)

The death of otherwise low risk mother and her fetus in our case is a serious matter. Esurience of properly chlorinated water in city should be a priority of government authorities and adequate measures need to be taken. Public awareness programs to educate people about the risk of the disease and its prevention should be planned through electronic and print media. Special arrangements should be made for conducting such programs in schools, colleges, universities, hospitals and other public places.

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