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RHINO-ORBITAL MUCORMYCOSIS MIMIC ACUTE STROKE

***Umakanth, M.**

Lecturer in Medicine, Faculty of Health Care sciences, Eastern University SriLanka

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****Corresponding author***

ABSTRACT

Rhinocerebral mucormycosis is a rare opportunistic infection of the sinuses, nasal passages, oral cavity, and brain caused by saprophytic fungi. The infection can rapidly result in death. Rhinocerebral mucormycosis commonly affects individuals with diabetes and those in immunocompromised states. There are spectrums of clinical presentation of this fungal infection however, this case presented as acute stroke is a one of the rare presentation. Timely detection, control of the underlying condition with aggressive surgical debridement, administration of systemic and local antifungal therapies, hyperbaric oxygen as adjunctive treatment improves prognosis and survivability.

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INTRODUCTION

Mucormycosis is a hastily progressing fungal infection caused by filamentous fungi in the mucoraceae family. It is frequently seen in diabetic and immunocompromised patients(Report 2007;Bakshi 2017). It is categorized as rhinocerebral, pulmonary, cutaneous, gastrointestinal or disseminated, depending on organ involvement. Saprophytic aerobic fungi of the class Phycomycetes (order mucorales) cause rhinocerebral mucormycosis, also known as phycomycosis. The 3 genera responsible for most cases are Rhizopus, Absidia, and Mucor**.** Phycomycetes are ubiquitous in nature, is commonly found in decaying vegetation, soil, and bread mold. They grow rapidly and can release large numbers of airborne spores. Thus, they are frequently found colonizing the oral mucosa, nose, paranasal sinuses, and throat. Phycomycetes do not generally cause disease in immunocompetent individuals who are able to generate phagocytic containment of the organisms.When the fungus is invades the paranasal sinus mucosa, it may spread directly to the orbital apex and from here to get access to the brain. The disease is characterized by fungal hyphal invasion of blood vessels resulting in thrombosis and infarction of the nasal, paranasal sinus, orbital, and cerebral tissues(Anon, 2013).

There are spectrums of clinical presentation of this fungal infection ranging from rhinitis, periorbital and facial swelling, facial and mucosal necrosis, ophthalmoplegia, black eschar nasal discharge, multiple cranial nerve palsies, facial pain, to a headache. However, one sided face, arm, and leg weakness is a very rare presentation and this type of weakness misguide as an acute stroke. Approximately 2/3 of cases occur in diabetic patients with ketoacidosis (Chen *et al*. 2017). Other risk factors include neutropenia, desferrioxamine therapy, patients with iron overload (hemodialysis, hemochromatosis), intravenous drug abuse, chemotherapy, hematologic malignancy, bone marrow transplant, solid organ transplant, and use of steroids or immunosuppressives.

Case history

A 55- years- old male patient presented with a history of right sided headache and fever for three days duration. A headacheache and fever were well responded with paracetamol. Patient developed sudden onset of left-sided face, arm, and leg weakness. Immediately, he was brought to the emergency department and assessed for thrombolysis. Urgent Computerized tomography (CT) of the brain was taken, which revealed soft tissue enlargement of the right eyeball.

On admission, he was found to be a febrile, conscious and well oriented to the time and place, with a BP of 160/90mmHg, a pulse of 82/min and with grade three weakness of left -sided arm and leg .After admission, his weakness gets worse, and unable to speak any sentence. The second day of the admission, we noticed right orbital swelling. His fasting blood sugar was 114mg/dl, sodium was 135mEq/L, potassium was 3.5mEq/L., urea was 19mg/dl creatinine was 1.4mg/dl and haemoglobin was 11.7gm%. His total count was $5x10^9$/l, differential count was Neutrophils-88, Lymphocytes- 10, monocytes-00, eosinophils-02, basophils-00/cumm and his platelet count was $345x10^9$/l. His CRP was 240 and ESR was 110mm/h. The microscopic examination of the biopsy material and the nasal discharge was taken. It showed the characteristic broad aseptate branched hyphae. An ophthalmologic examination confirmed endophthalmitis. We started intravenous administration of amphotericin B (AmB) 1 mg/kg/day with daily monitoring of the kidney functions, IV cefuroxime 2g twice daily and intravenous metronidazole 500mg thrice a day. He was planned for aggressive surgical debridement. However, third day of the admission his condition gets worse and he passed away.

DISCUSSION

Rhino-orbital-cerebral zygomycosis or Rhino-orbital-cerebral mucormycosis, zygomycosis, phycomycosis, or orhyphomycosis is most commonly caused by Rhizopus oryzae (90%). Other common species of the order mucorales-causing infections include Absidia corymbifera**,** Mucor ramosissimus**,** Rhizomucor pusillus**,** and Apophysomyces elegans *(Mohamed et al. 2015)***.** It is a non-septate filamentous fungus and is generally found in soil, decaying fruit and vegetables, animal feces, and old bread. occurs almost exclusively in the immunocompromised host(Anon, 2013). This non- diabetic, farmer complained of right sided headache and fever for initial three days duration. These symptoms responded with paracetamol, however fourth day of illness he developed left sided face, arm and leg weakness. Initially we thought that it could be space occupying lesion or vascular events. On admission there is no evidence of periorbital swelling or nasal discharge. We arranged urgent CT brain which only revealed that soft tissue enlargement of the right eye ball. Then we suspected that space occupying lesion could cause this symptoms and we given-up the plan of thrombolysis. Second day of the admission we noticed that periorbital swelling, then we suspected it could be fungal infection or cavernous sinus thrombosis. We arranged repeat CT brain which revealed sequestrated right maxilla up to the infraorbital rim and opacification of the maxillary, ethmoid, and sphenoid air sinuse.

According to the literature, clinical signs in rhino-cerebral mucormycosis presented with headache, facial swelling, pain, periorbital edema, black eschar nasal discharge, and if the fungal infection extended to nasal turbinate, the orbital structures become involved may lead to proptosis, chemosis, resulting in ophthalmoplegia, and loss of vision(Ugurlu *et al*. 2014).Through the superior orbital fissure the disease may extend to the cavernous sinus and cause brain infarctions. Adjoining spread to cerebral tissue occurs through bony erosion or invasion of blood vessels, nerves and lymphatics (Hopkins *et al*, 1994; Snaith *et al*. 2016). Once the disease extends to the brain, the patient suffers from decreased consciousness and then coma, where the prognosis becomes poor. Third day of the admission, patient's conditions get worse, conscious level went down and right eye bulge more prominently. However, before surgical intervention this patient was passed away. As he was a farmer, chances of expose with fungal spore is high, however he did not have any detectable precipitating factors. A research article published by Roden *et al* which stated that 9.6% of patient infected with mucormycosis does not have any precipitating factors (Roden *et al*, 2005: Sahi *et al*. 2009). Correcting hypoxia, acidosis, hyperglycemia, and electrolyte abnormalities is significant to the successful management of this condition. Hyperbaric oxygen (HBO) therapy has been used in an attempt to control the infection. Experts suggest that HBO may exercise fungistatic activity by reducing tissue hypoxia and acidosis. If the disease is restricted to the sinus and orbit debridement and systemic antifungals, combined with local amphotericin irrigation, may control the process.

Conclusion

Rhino-orbital mucormycosis is a rare but life-threatening infection that generally occurs in patients with diabetes mellitus and other immune deficiency conditions. It always misleading and possibly causes a delay in treatment. Early recognition and treatment are essential because it may lead to death in few days. Fungal infection of the nasal cavity is uncommon but is being seen with increasing frequency in patients with immune deficiency.

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