Abstract: Mucormycosis is a serious invasive fungal infection, common in patients with uncontrolled diabetes mellitus and has a high propensity for vascular invasion. Based on the site of involvement it is classified into rhinocerebral, pulmonary, cutaneous and gastrointestinal forms, out of which rhinocerebral mucormycosis is the most common form. Here we report a case of rhinocerebral mucormycosis occurring in a patient with uncontrolled diabetes mellitus presenting with hemiplegia due to internal carotid artery invasion.

Keyword: Rhinocerebral mucormycosis, cavernous sinus thrombosis, internal carotid artery invasion

Case Report:
A 61 years old male, known diabetic for the past 15 years and not on regular treatment, developed fever for 3 days duration associated with pain, swelling and difficulty in movement of left eye and drooping of left eyelid. 2 weeks later patient presented to us with sudden onset of weakness of right upper and lower limbs. There was no history of seizures or trauma. Patient developed altered sensorium subsequently. On examination, patient was drowsy, irritable, responding to pain and occasionally to calls, afebrile and thin built. His vitals were stable. Capillary blood glucose level was 174 mg/dl. Since the patient was drowsy, his higher mental functions could not be assessed. Proptosis of his left eye was noted. Left pupil was dilated and both direct and consensual light reflexes were negative. Right pupil was normal in size and reacting only to direct light. No movement was noted on the left side during testing of oculo-cephalic reflex. There was ptosis of the left eyelid. Patient did not have nystagmus. There was deviation of angle of mouth to left. Paucity of movements and hypotonia were noted in right upper and lower limbs. Plantar was extensor on right side. Sensory system and cerebellum could not be tested. No involuntary movements were noted. There was no neck stiffness or other signs of meningeal irritation. Cardiovascular system examination was normal. Examination of respiratory system including nose was normal. Oral cavity and abdomen examination was also found to be normal.
Complete blood count, renal and liver function tests were normal. His plasma glucose was 204 mg/dl. Urine acetone was tested negative. No abnormality was noted in chest X-ray and electrocardiogram. An urgent plain CT brain with orbit was performed which showed left sino-nasal inflammation extending into all sinuses, orbital apex, superior orbital fissure and anterior part of cavernous sinus along with massive left MCA territory infarct. MRI brain revealed left orbital inflammation extending up to left cavernous sinus and left internal carotid artery. Non-visualization of left internal carotid artery was noted in MRA. Diagnostic nasal endoscopy was performed which revealed blackish necrotic lesion in the left nasal cavity involving septum, floor and lateral wall. Swab was taken and sent for microbiological examination. KOH mount of the sample revealed wide, thick-walled, ribbon-like, aseptate hyphal elements that branch at right angles diagnostic of Mucorales which was subsequently confirmed on fungal culture. Patient was started on Amphotericin B deoxycholate 50 mg once daily, insulin according to CBG along with other supportive measures. Patient’s condition did not improve and succumbed to the illness after 2 weeks.

Discussion: Mucormycosis is an invasive systemic fungal infection caused by fungi of the order Mucorales, Rhizopus oryzae being the most common. The hyphal elements of Rhizopus oryzae are wide, thick-walled, ribbon-like, aseptate and branch at right angles. It is more common in patients with diabetes (especially in DKA), defective phagocytic function (especially neutropenia, steroid use, etc.), elevated serum iron level, solid organ transplantation and malignancy. Mucormycosis is clinically divided into several categories based on anatomical site and clinical presentation: rhinocerebral, pulmonay, cutaneous, gastrointestinal, disseminated and miscellaneous. Rhinocerebral mucormycosis is the most common form of the disease. It spreads to orbit and cavernous sinus from ethmoid sinus. It also spreads to hard palate and causes painful necrotic ulceration. Early diagnosis is essential since early initiation of therapy is associated with improved outcome in these patients. Hence high index of suspicion is required for diagnosis of mucormycosis in susceptible individuals and appropriate clinical setting. Definitive diagnosis is made by biopsy of the infected tissue with histopathological examination and culture. Histopathology differentiates Mucorales from Aspergillus, Fusarium and Scedosporium species which have thinner hyphae which branch at acute angles. Imaging studies with CT and MRI will help in assessing the extent of the disease. Patients presenting with sinusitis, proptosis, orbital cellulitis and cavernous sinus thrombosis, bacterial pathogens like Staphylococcus aureus and Streptococci should be ruled out. Tolosa-Hunt syndrome which is characterized by painful ophthalmoplegia, ptosis, headache and cavernous sinus inflammation can be differentiated from mucormycosis by biopsy and its benign clinical course. Successful treatment requires early diagnosis and consists of reversal of underlying predisposing factors, surgical debridement and prompt anti-fungal therapy. Primary anti-fungal agent effective in mucormycosis is amphotericin B which is available in various forms which have differing pharmacokinetic properties. Amphotericin B deoxycholate (1 -1.5 mg/kg od) is highly toxic and has poor CNS penetration. Liposomal amphotericin B (5-10 mg/kg od) is less nephrotoxic and has better CNS penetration. Amphotericin B lipid complex (5-7.5 mg/kg od) is less nephrotoxic but less efficacious for CNS infection than liposomal form. Patients should be carefully monitored during therapy for reactions and electrolyte disturbances. Longer duration of anti-fungal therapy is usually required which is based on clinical and radiological improvement as well as improvement of underlying immunosuppression.

Conclusion: Due to the propensity for extensive local tissue destruction and angioinvasion leading to disseminated disease which requires highly toxic therapy for longer duration in already immunocompromised patients makes it obvious the necessity for high index of suspicion and early diagnosis.
References:


