Our Experience with Retrobulbar Amphotericin-B in Patients of Rhino-Orbital-Cerebral Mucormycosis (ROCM) at GMERS Gotri

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Abstract: Purpose: To evaluate ocular features in Rhino-Orbital-Cerebral Mucormycosis (ROCM) and to study outcome of retrobulbar injection Amphotericin-b in the patients of ROCM following COVID-19. Methods: 118 confirmed cases of ROCM following COVID-19 were analyzed retrospectively. Results: Out of 118 patients, 74 patients had disease in the nose and paranasal sinuses (PNS), 37 showed orbital involvement as well and 7 patients had severe disease involving the brain also. Out of 118 patients, 17 patients were given Retrobulbar Amphotericin-B injection of which 13 recovered well. 5 orbital exenterations were done, out of which one patient survived. Conclusion: Retrobulbar Amphotericin –B injection serves important role in preventing spread of fungus to the brain and improving mortality.

Keywords: COVID-19, Rhino-Orbital-Cerebral Mucormycosis, Retrobulbar Amphotericin-B, exenteration

1. Introduction

The second wave of COVID-19 in India has presented challenge to the medical fraternity. Severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) was found to be associated with systemic immune alterations including various bacterial and fungal infections. 1 Mucormycosis is commonly confined to the patients with altered immunity such as in transplant recipients, diabetics, patients with malignancies and patients on corticosteroid therapy. Uncontrolled diabetes is considered as the strongest risk factor for mucormycosis.² Three Mucormycosis is classified as rhino–orbital–cerebral, pulmonary, cutaneous, gastrointestinal and disseminated form based on the site of involvement. This article discusses the institutional experience of 118 cases of ROCM related to COVID-19 infection.

2. Methods

Ours is a Retrospective cohort study in which patients admitted for ROCM from April 2021 to August 2021 in GMERS medical college Gotri, Vadodara, Gujarat, India were taken into study.

Inclusion criteria: patients who are confirmed cases of ROCM based on Microbiological evidence for fungal elements of mucormycosis from biopsy sample were enrolled in the study.

Exclusion criteria: Non-consenting patients

Study procedure:
The assessment involves detailed history taking for clinical features and presentation of various symptoms, diabetic status, past history of COVID-19 & taking steroids treatment for COVID-19. Visual assessment was done with snellen’s chart. Extraocular movements were checked in all gazes in all patients. For all patients ophthalmic examination of anterior segment was done with torch light and with slit lamp. Posterior segment for all patients was examined with Indirect binocular ophthalmoscopy after dilatation with Tropicamide 0.5 % eye drop.

Diagnosis
Diagnosis was made by MRI orbit+ paranasal sinus+ brain with gadolinium contrast in all suspected patients, diagnostic nasal endoscopy in all patients, tissue biopsy and histopathological examination during diagnostic nasal endoscopy or sinus debridement.

All patients with Microbiological evidence for fungal elements of mucormycosis from biopsy sample were given Intravenous Amphotericin-b after physician clearance and monitored for the same for continuation.

Criteria considered for Retrobulbar Amphotericin-B injection in RhinoOrbital-Cerebral Mucormycosis (ROCM) patients:
1) Patient consenting for the procedure
2) Positive findings on MRI showing either of these features:
   • Involvement of orbital floor, roof, medial or lateral wall
   • Involvement of orbital apex
   • Involvement of cavernous sinus
Invasive fungal disease. It has a very high mortality rate. Mucormycosis has emerged as one of the life threatening complications of COVID-19. Mucor and Rhizopus are the two most common species causing mucormycosis. They are found abundantly in the environment, commonly in hot and humid conditions. Mucormycosis has emerged as one of the life threatening complication of COVID-19 infection in India during second wave. Rhino–orbital–cerebral mucormycosis is a serious invasive fungal disease. It has a very high mortality rate even with best possible treatment available. It acts by invading blood vessels and mycotic thrombosis causing infarction and ischemic necrosis of host tissue.

Out of 118 patients, 14 patients had total ophthalmoplegia in one eye on presentation. One patient had total ophthalmoplegia in both eyes on presentation. 7 patients had variable degree of muscle movement restriction in affected eye. While one patient had bilateral 6th nerve palsy leading to B/L lateral rectus restriction.

Out of 118 patients diagnosed with mucormycosis, 32 patients had one of following clinical features on presentation-lid edema, ptosis, proptosis, and conjunctival chemosis. 4 patients had presentation with cutaneous involvement in the form of black eschar.

Out of 118 patients, 71 patients had only mild to moderate sinusitis on MRI scan with contrast due to invasive fungal involvement. While 27 patients showed involvement of orbit on MRI scan. 4 patients had MRI finding suggestive of brain involvement.

Out of 118 patients diagnosed with mucormycosis, 17 patients were given Retrobulbar Amphoterican-B injection after satisfying criteria for the same. One patient refused for Retrobulbar Amphoterican-B injection after 2 doses. While one patient took discharge against medical advice after 2 doses of Retrobulbar Amphoterican-B injection. 13 patients were given total of 7 doses of Retrobulbar Amphoterican-B injection while 2 patients were given 9 doses of retrobulbar Amphoterican-B injection due to recurrence of disease.

4. Discussion

Mucor and Rhizopus are the two most common species causing mucormycosis. They are found abundantly in the environment, commonly in hot and humid conditions. Mucormycosis has emerged as one of the life threatening complication of COVID-19 infection in India during second wave. Rhino–orbital–cerebral mucormycosis is a serious invasive fungal disease. It has a very high mortality rate.

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patients had taken steam inhalation at some period during COVID-19 infection.

The fungal spores reach sinuses through inhalation via nares which gets deposited in nasal mucosa. It reaches orbit through ethmoid bone, inferior orbital fissure, lamina papyracea or via orbital apex. The brain is involved when fungal infection directly involves cribiform plate, supraorbital fissure, or by perineural invasion and hematogenous spread.9 In our study, 74 patients had disease restricted to nose and paranasal sinuses (PNS), 37 showed orbital+paranasal sinuses involvement and 7 patients had severe disease involving orbit+paranasal sinuses+brain.

Medical treatment of mucormycosis includes antifungal therapy and control of associated systemic diseases mainly diabetes. While surgical treatment includes debridement of necrotic and unhealthy tissues from nose, paranasal sinuses and other involved tissues. Exenteration was indicated when there was due risk of involvement of brain.10

In our study, all of 118 patients were treated with Intravenous Amphotericin-B injection after physician clearance. On discharge they were treated with oral Posaconazol for three months. While 14% patients were treated with Retrobulbar Amphotericin-B injection. 94% patients underwent extended endoscopic sinus surgery and debridement. While 4.2% patients underwent orbital exenteration.

In retrospective analysis, high mortality rate has been seen in patients who underwent orbital exenteration. In our study out of 5 patients who were treated with exenteration 4 patients died after surgery due to systemic complications, which is mortality rate of 80% of treated patients with exenteration.

In our study, 17 patients were treated with Retrobulbar Amphotericin B injection. Out of these 17 patients, 13 patients had complete recovery in preventing spread of fungus to the brain and improving mortality. Role of Exenteration in improving mortality can be debatable further. Patients should be educated regarding sign and symptoms of mucormycosis in recovered COVID-19 cases. Follow up at regular interval in recovered patients should be done.

5. Conclusion

Retrobulbar Amphotericin-B injection serves important role in preventing spread of fungus to the brain and improving mortality. Role of Exenteration in improving mortality can be debatable further. Patients should be educated regarding sign and symptoms of mucormycosis in recovered COVID-19 cases. Follow up at regular interval in recovered patients should be done.

References


