

GOVERNMENT OF ANDHRA PRADESH
HEALTH, MEDICAL & FAMILY WELFARE DEPARTMENT

Order No. 122/COVID-19/2021

Dated: 18/05/2021

COVID Instant Order – 123

Sub: Management Protocol for Mucormycosis – Orders – Issued.

Ref: 1. Video Conference with Districts by Hon'ble Minister of Urban Development, GoAP on COVID-19, dt: 24.04.2021.
2. Video Conference with Districts on COVID-19 by the Chairman COVID-19 State Control Room and Principal Secretary of HM&FW, dated: 25.04.2021
3. Meeting of the AP State Expert Committee on Clinical Management of COVID-19, Dt 18.05.2021.



In view of current COVID-19 situation and incidence of Mucormycosis cases, Management Protocol for Mucormycosis is hereby attached. The notified Hospitals which can treat the patients is attached as annexure where treatment can be taken up.

All Collectors & Special Officers are requested to take immediate necessary action.

Encl: Management Protocol for Mucormycosis



Principal Secretary to Government

To

The All Collectors and District Magistrates in the State for immediate action

The All Joint Collectors and Addl. District Magistrates (Development) for necessary action

All the DM&HO's in the State for necessary action and implementation

Dept of Health, Medical & Family Welfare, GoAP

Mucormycosis

Management Protocol

5-18-2021

Contents

Introduction	2
Predisposing factors	2
High-risk groups.....	2
Symptoms.....	2
Signs.....	3
Diagnosis.....	3
Sample.....	3
Microbiology.....	3
Pathology.....	4
Radiology	4
Investigations	4
Treatment	4
Medical.....	4
Surgical	5
Follow up.....	5
Preventive Measures	7
Annexure	7

Introduction

Mucormycosis is an opportunistic devastating fungal Rhino-Orbital-Cerebral infection. It spreads through spores through nasal route. Because it is a rapidly progressive fungal disorder, delay in identification & management leads to high morbidity & mortality.

The fungus is Angio invasive & occludes blood vessels, causes tissue necrosis. From the Nasal cavity it enters the Middle turbinate to reach Maxillary Sinus. From there it erodes the Floor of the Orbit to reach Eye and further to Central Nervous System. Also causes Pulmonary Embolism. Pulmonary Mucormycosis is rare.

Predisposing factors

- Uncontrolled Diabetes Mellitus
- Inappropriate use of Steroids
 - High doses of steroids
 - Using for prolonged periods
- Immunosuppressant individuals.
 - Malignancy
 - Post-transplant
- Prolonged use of broad spectrum antibiotics
- People under long standing oxygen therapy
- Prolonged ICU stay
- People under mechanical ventilation
- Added angioinvasion and endothelial damage due to thrombotic microangiopathy, because of COVID-19 virus as such.
- Nosocomial
 - Contaminated dirty linen (health care associated mucor)
 - It infects through gadgets in ICUs if not properly sterilized.

High-risk groups

1. Diabetes Mellitus patients
2. Patients on High dose steroids
3. Patients on Immunomodulators

Symptoms

- Pain and redness around eyes and/or nose
- Fever
- Headache
- Facial swelling
- Paresthesia/anaesthesia of the nose, cheeks, teeth and palate

- Toothache
- Nose related
 - Dryness in the nose with blackish crusting
 - Unilateral obstruction/stuffiness of the nose
 - Nasal discharge, maybe blood stained
- Sinus related
 - Unilateral headache
- Eyes related
 - Peri orbital swelling
 - Blurred or double vision, Decreased vision, Loss of vision
- Chest pain
- Altered mental status

Signs

- Nasal examination
 - Ulceration, necrosis and discharge
 - Nasal cavity shows a blackish discoloration of the middle turbinate (most commonly) and nasal mucosa and sinus mucosa.
- Oral Examination: Black eschar on the Palate
- Sinusitis
 - Tenderness of cheek bone
- Ocular examination
 - Redness
 - Proptosis/protrusion of eye
 - Restricted eye movement
 - Ophthalmoplegia
 - Fundus examination: cherry red spot or disc edema or both.
- Haemoptysis due to necrosis of lung

Diagnosis

Sample

- Deep nasal swab
- Debrided tissue

Microbiology

- KOH smear for Microscopy

On a slide take 10-20% Potassium Hydroxide based on viscosity/thickness of the sample to cover the sample. Cover the preparation with a coverslip and leave for 30 minutes. Thick hyperkeratotic sample may take 30 minutes to an hour for digestion. Preheating the slide before microscopic examination and addition of 40% Dimethyl Sulfoxide (dmsO) to 10% KOH in equal proportion causes rapid digestion of keratin, allows

immediate examination under microscope. Examine for broad aseptate hyaline hyphae (Ribbon like) first under low power (10x) followed by high power (40x).

- Fungal culture

On Saboraud's dextrose agar or Potato dextrose agar in a test tube at 25-30⁰c. Do not culture in a Petri dish. Any growth suggestive of fungi should be examined by making Lactophenol cotton blue mount on a slide and examined under microscope for identification of the fungus.

Pathology

- Debrided tissue for HPE
 - If Exenteration or Sinus debridement is planned, HPE report from biopsy must be obtained.

Radiology

- CT Scan of Paranasal sinuses
- MRI paranasal sinuses and orbits (with Gadolinium contrast) T2 images with and without fat suppression
 - It helps to understand the extent of involvement
 - It shows soft tissue involvement
- Diagnostic nasal endoscopy is another investigation.
- ❖ Start Inj. Liposomal Amphotericin-B in very high clinical suspicion.

Investigations

1. Blood
 - a. Monitor cell counts
 - b. Monitor CRP levels
 - c. Monitor Serum Creatinine
 - d. Monitor Renal Function Test

Treatment

The treatment approach demands multi-disciplinary approach involving General Physician, ENT surgeon, Ophthalmologist, Neurologist, Neurosurgeon and Head & Neck surgeon depending on the extent of involvement. Treatment should be started early and aggressively. Refer Figure 1 for Management Algorithm.

Medical

- **Inj. Liposomal Amphotericin-B, 5mg/kg/day (Usually 2 to 6 weeks)**
 - Dosage:
 - 5 mg/kg body weight given as intravenous infusion for Mucormycosis restricted to paranasal sinuses
 - To be increased incrementally to 8-10 mg/kg body weight in cases of associated orbital/cerebral involvement
 - Method of dilution:
 - For an average adult of 60kg weight, 300mg (6 vials of 50mg each) of

Liposomal Amphotericin B is dissolved in 60ml of distilled water (normal saline should NOT be used for reconstitution). Note: Each 50mg vial of Liposomal Amphotericin B is reconstituted with 10ml of distilled water.

- **Infusion:** The 60ml of reconstituted solution is added to 300ml of 5% Dextrose which is infused intravenously over a period of 2 hours.
- **Monitoring:** Serum Creatine and C-Reactive Protein to be done on every alternate day throughout the course of treatment with Amphotericin B.
- **Posaconazole oral suspension** to be given after completion of a course of Amphotericin B, up to 2-4 weeks.
 - Dosage: 300mg once a day orally for 2 weeks (maybe extended to 4 weeks if necessary) up to clinical recovery or Radiological resolution
- **Salvage therapy:** In patients who cannot tolerate Amphotericin B due to severe renal impairment,
 - Injection Posaconazole 300mg intravenous injection to be given 12 hourly on the first day, followed by 300mg every 24 hours from second day onwards, up to 2 weeks or till clinical recovery or Radiological resolution

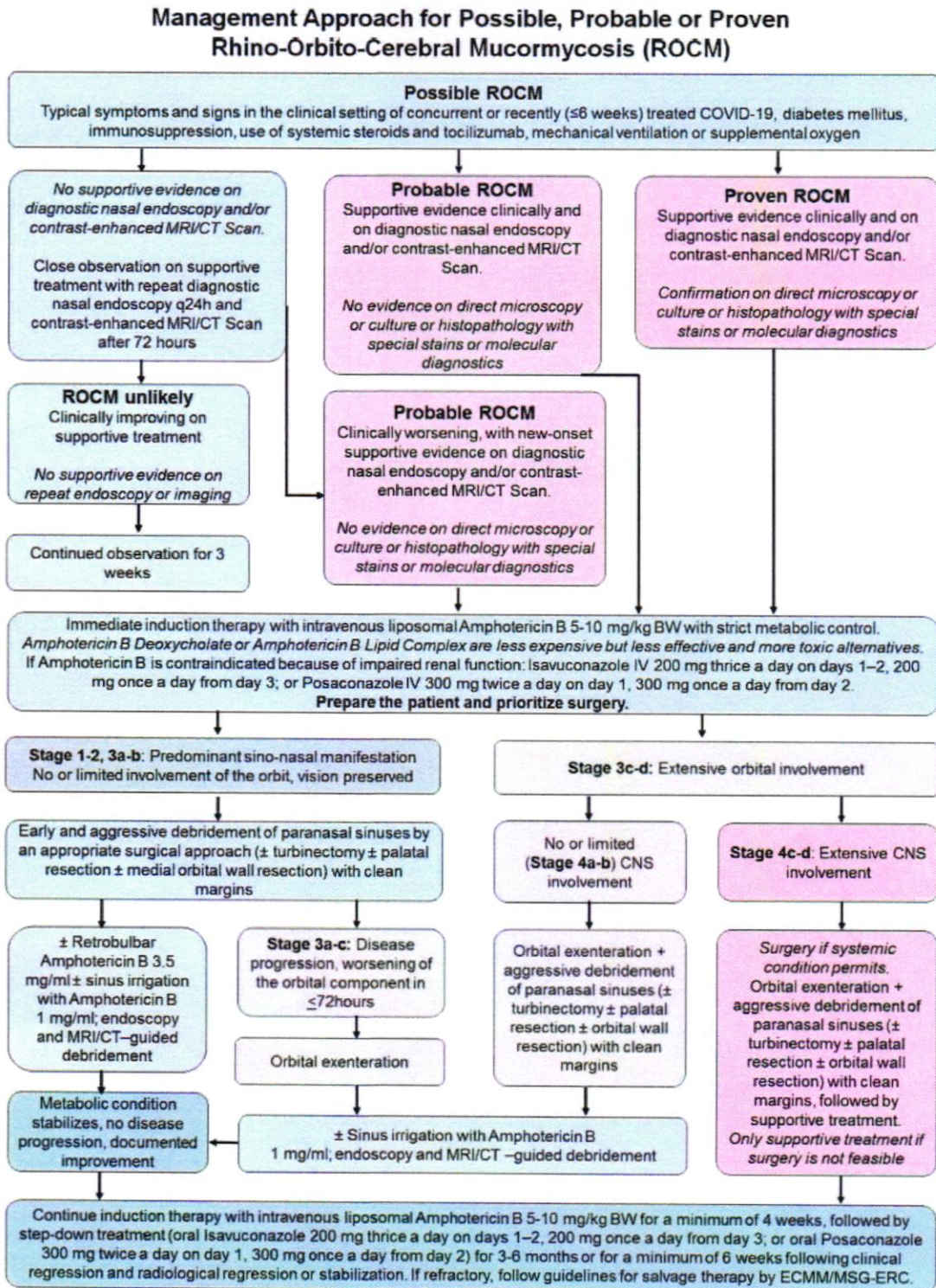
Surgical

- ENT:
 - Debridement to prevent the spread. Endoscopic Debridement to be done of the necrotic area aggressively from the Sino-nasal region at the earliest possible as an emergency procedure
 - Endoscopic medial orbitotomy if required
- Ophthalmology:
 - Refer Figure 1
 - Exenteration if more than 3 (three) Ocular muscles are involved
- Pulmonary:
 - Cardio-Thoracic surgeon to decide on extent of Resection, Segmentectomy or Lobectomy surgery.

Follow up

- Post-operative follow up with diagnostic nasal endoscopy and further debridement if needed

Figure 1 Management algorithm for Rhino-Orbito-Cerebral Mucormycosis (ROCM)



Preventive Measures

1. Personal hygiene
 - a. Good Oral hygiene
2. Medical Management
 - a. Judicious use of steroids at right time, right dose and for right period.
 - i. No steroids if patients are not hypoxic.
 - ii. Avoid prescribing post-discharge Steroids
 - b. Strict diabetes control (110-180mg%) with Insulin and Oral Hypoglycemic Agents.
 - i. GRBS testing of every hospitalized patient at least once a day to monitor Blood sugar levels.
 - ii. Proper management of Diabetic Keto-Acidosis.
3. Hospital/Institutional level
 - a. Use clean, sterile water for humidifiers during oxygen therapy
 - b. Disinfecting all gadgets in ICU regularly.
 - c. Not to reuse disposable oxygen delivery devices like Nasal prongs, Face masks etc.
4. Advice to the Patient and care giver at the time of discharge:
 - a. Monitor blood glucose level in diabetics
 - b. Inform the patients about early symptoms & signs of Mucor:
 - i. Nasal blockage/Blood-tinged nasal discharge
 - ii. Pain in the eye/swelling of the eye/double vision
 - iii. Hemi cranial head ache/headache/numbness over the face.
 - iv. Tooth ache/loosening of teeth/discomfort during chewing.
 - v. Follow up on day 7 and 3 weeks after discharge.
5. In view of current COVID-19 situation and to be watchful of incidences of Mucormycosis, it is to be made a "Notifiable disease" requiring both Government & Private practitioners to notify to public health authorities, i.e., DMHO/Collector of suspected and confirmed cases of Mucormycosis.

Annexure - 1

List of hospitals where Multidisciplinary treatment is available:

1. GGH Ananthapuramu (Government Medical College, Ananthapuramu)
2. SVRRGGH, Tirupathi
3. SVIMS, Tirupathi
4. GGH Kakinada (Rangaraya Medical College, Kakinada)
5. GGH Guntur (Government Medical College, Guntur)
6. GGH (RIMS), YSR Kadapa
7. GGH Vijayawada
8. Government Regional Eye Hospital, Kurnool
9. GGH Kurnool
10. GGH (RIMS) Ongole, Prakasam
11. GGH Nellore (ACSR Government Medical College, Nellore)
12. GGH Srikakulam (Government Medical College, Srikakulam)
13. Government ENT Hospital, Visakhapatnam

14. Government Regional Eye Hospital, Visakhapatnam
15. Government Hospital for Chest Diseases (Andhra Medical College)
16. King George Hospital (KGH), Visakhapatnam
17. VIMS, Visakhapatnam

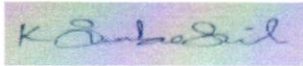
The treatment will also be available in any other hospital having requisite speciality treatment as notified by CEO Dr YSR Arogyasri Health Care Trust from time to time.

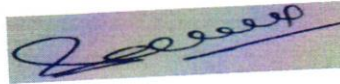
End of content



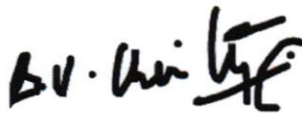




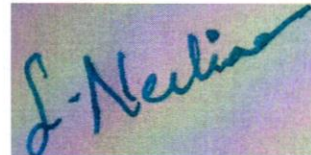














End of the document