MUCORMYCOSIS DURING COVID 19 PANDEMY

PAYAM TABARSI
NRITLD
SBMU
Case Report: Coronavirus Disease 2019-associated Rhinosinusitis Mucormycosis Caused by Rhizopus arrhizus: A Rare but Potentially Fatal Infection Occurring After Treatment with Corticosteroids

Payam Tabarsi, Neda Khalili, Mihan Pourabdollah, Somayeh Sharifynia, Ali Safavi Naeini, Jahangir Ghorbani, Abdolreza Mohamadnia, Zahra Abtahian, and Elham Askari

Case presentation

• A 50-year-old woman with a 3-day history of dry cough, shortness of breath, myalgia, and fatigue
• Past Medical Hx: Type 2 diabetes mellitus and hypertension (5 years ago)
• Past Surgical Hx: Gastric bypass surgery (2 years ago)
• Habitual Hx: No tobacco smoking or alcohol consumption
• Drug Hx: Antihypertensive drugs (diltiazem and losartan)
  No drugs for diabetes
Upon initial admission

- Hemodynamically stable (BP= 160/100 mmHg and PR= 78 bpm)
- No fever (oral T= 37.2 °C)
- Increased RR= 32 breaths/min
- Oxygen saturation= 88% (on room air)
- Blood tests: normal (random plasma glucose level= 224 mg/dL)
- Positive RT-PCR for SARS-CoV-2
Treatment during hospital stay

- Remdesivir (200 mg on day 1 and 100 mg on days 2–5) + dexamethasone (6 mg once daily for 10 days)
- Discharged after 21 days (oxygen saturation= 95% on room air)
Five days after discharge

Presenting manifestations

• Facial swelling, facial numbness, periorbital edema, and erythema, (more prominent on the left side) and headache

Physical examination

• Necrotic eschars on the palate and nasal turbinates
Upon second admission

Laboratory tests:
• Random plasma glucose= 256 mg/dL
• HbA1c= 7.4%
• Leukocytes= 12.8 \times 10^3 /mL (Neutrophils: 78%)
• Hemoglobin= 11.4 g/dL
• CRP= 53 mg/l
• ESR= 71 mm/h
• LDH= 402 U/L
• All other tests: Normal
Management

• Nasal endoscopy
• CT scan of the paranasal sinuses:
  Severe mucosal thickening of the left maxillary sinus and erosive changes of the maxillary sinus and the left inferior orbital rim (Suggestive of invasive fungal rhinosinusitis)
• Tx: Surgical debridement of the necrotic tissues + intravenous liposomal amphotericin B
• Discharged after 28 days
• Posaconazol syrup was continued for 6 weeks
Diagnosis of *Rhizopus arrhizus*

**Histopathological examination of tissue biopsy samples**

- Broad, pauciseptate hyphae with right-angle branching visible within the wall and lumen of blood vessels

**Direct smear with 10% KOH**

- Hyaline mycelium with hyphae typical of Mucorales

**Culture on Sabouraud dextrose agar**

- Growth of grayish-white (and later grayish dark brown) colonies with a woolly texture 2 days after incubation
Continued…

• Lactophenol cotton blue staining of the cultured fungi showed hyphae with nodal rhizoids and short sporangiophores with round black sporangia

Sequencing of the internal transcribed spacer (ITS) region of the ribosomal DNA

• *Rhizopus arrhizus* (aka *Rhizopus oryzae*)
• Nasal stuffiness
• Foul smell
• Epistaxis
• Nasal discharge - mucoid, purulent, blood-tinged or black
• Nasal mucosal erythema, inflammation, purple or blue
discoloration, white ulcer, ischemia, or eschar
• Eyelid, periorcular or facial edema
• Eyelid, periorcular, facial discoloration
• Regional pain – orbit, paranasal sinus or dental pain
• Facial pain
• Worsening headache
• Proptosis
• Sudden loss of vision
• Facial paresthesia, anesthesia
• Sudden ptosis
• Ocular motility restriction, diplopia
• Facial palsy
• Fever, altered sensorium, paralysis, focal seizures
Possible ROCM
Typical symptoms and signs in the clinical setting of concurrent or recently (≤6 weeks) treated COVID-19, diabetes mellitus, immunosuppression, use of systemic steroids and tocilizumab, mechanical ventilation or supplemental oxygen

No supportive evidence on diagnostic nasal endoscopy and/or contrast-enhanced MRI/CT Scan.
Close observation on supportive treatment with repeat diagnostic nasal endoscopy q24h and contrast-enhanced MRI/CT Scan after 72 hours

ROCM unlikely
Clinically improving on supportive treatment
No supportive evidence on repeat endoscopy or imaging

Probable ROCM
Supportive evidence clinically and on diagnostic nasal endoscopy and/or contrast-enhanced MRI/CT Scan.

Probable ROCM
Clinically worsening, with new-onset supportive evidence on diagnostic nasal endoscopy and/or contrast-enhanced MRI/CT Scan.

Proven ROCM
Supportive evidence clinically and on diagnostic nasal endoscopy and/or contrast-enhanced MRI/CT Scan.
Confirmation on direct microscopy or culture or histopathology with special stains or molecular diagnostics
Continued observation for 3 weeks

No evidence on direct microscopy or culture or histopathology with special stains or molecular diagnostics

Immediate induction therapy with intravenous liposomal Amphotericin B 5-10 mg/kg BW with strict metabolic control. Amphotericin B Deoxycholate or Amphotericin B Lipid Complex are less expensive but less effective and more toxic alternatives. If Amphotericin B is contraindicated because of impaired renal function: Isavuconazole IV 200 mg thrice a day on days 1–2, 200 mg once a day from day 3; or Posaconazole IV 300 mg twice a day on day 1, 300 mg once a day from day 2.

Prepare the patient and prioritize surgery.

Stage 1-2, 3a-b: Predominant sino-nasal manifestation
No or limited involvement of the orbit, vision preserved

Stage 3c-d: Extensive orbital involvement
Continue induction therapy with intravenous liposomal Amphotericin B 5-10 mg/kg BW for a minimum of 4 weeks, followed by step-down treatment (oral Isavuconazole 200 mg thrice a day on days 1–2, 200 mg once a day from day 3; or oral Posaconazole 300 mg twice a day on day 1, 300 mg once a day from day 2) for 3-6 months or for a minimum of 6 weeks following clinical regression and radiological regression or stabilization. If refractory, follow guidelines for salvage therapy by ECMM/MSG-ERC.
• Judicious and supervised use of systemic corticosteroids in compliance with the current preferred practice guidelines
• Judicious and supervised use of tocilizumab in compliance with the current preferred practice guidelines
• Aggressive monitoring and control of diabetes mellitus
• Strict aseptic precautions while administering oxygen (sterile water for the humidifier, daily change of the sterilized humidifier and the tubes)
• Personal and environmental hygiene
• Betadine mouth gargoyle (not nasal drops)
• Barrier mask covering the nose and mouth
• Consider prophylactic oral Posaconazole in high-risk patients (>3 weeks of mechanical ventilation, >3 weeks of supplemental oxygen, >3 weeks of systemic corticosteroids, uncontrolled diabetes mellitus with or without ketoacidosis, prior history of chronic sinusitis, and co-morbidities with immunosuppression)