CLINICAL INFECTIOUS DISEASE SOCIETY
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DIAGNOSIS AND MANAGEMENT OF COVID-19 ASSOCIATED MUCORMYCOSIS (CAM): FACT SHEET FROM CIDS

1. **When to suspect CAM**
    a. Clinical features:
        i. Most often infection starts in paranasal sinuses, with subsequent extension to the orbit and cranial cavity (rhino-orbito-cerebral mucormycosis - ROCM); pulmonary mucormycosis much less common
        ii. Suspect ROCM with the following clinical findings:
            1. Symptoms: facial pain & numbness, headache, blocked nose, epistaxis, loosening of teeth, double vision, blurred vision, loss of vision
            2. Necrotic ulcers in nasal cavity, palate
            3. Orbital apex syndrome
            4. Cavernous sinus syndrome
    b. Predisposing conditions
        i. Poorly controlled diabetes mellitus
        ii. Diabetic ketoacidosis
        iii. Immunosuppressive treatment
2. **Confirming diagnosis**
    a. Imaging to assess extend of disease: MRI brain with contrast, CT scan ostiomeatal complex
    b. Fungal culture and histopathology of affected tissue
3. **Management of CAM**
    a. Treatment of uncontrolled diabetes mellitus and DKA
    b. Stop steroids and other immunosuppressive drugs (e.g., tocilizumab, baricitinib, tofacitinib etc.) (if patient is taking)
    c. Extensive surgical debridement to remove all necrotic tissue
    d. Antifungal treatment:

Drug	Dose	Duration*	Comments
1. Amphotericin B deoxycholate (AmBD)	1 mg/kg/day i.v.	4 to 6 weeks; guided by clinical response	1. Low cost 2. Needs PICC or CVC 3. Side effects
2. Liposomal amphotericin B (LAmB)	5 mg/kg/day i.v.	4 to 6 weeks; guided by clinical response	1. Expensive 2. Needs PICC or CVC 3. Side effects
3. Isavuconazole	200 mg TID i.v. / p.o. x 2 days, followed by 200 mg OD i.v. / p.o.	4 to 6 weeks; guided by clinical response	1. Expensive
4. Posaconazole	300 mg BID i.v. / p.o. x 1	4 to 6 weeks; guided by clinical response	1. Expensive 2. Drug interactions

	day, followed by 300 mg OD i.v. / p.o.	

*Duration of treatment decided on case-by-case basis depending on severity, response to treatment; may need oral therapy for 3 to 6 months in severe disease

4. **Prevention and management of AmB toxicity**
    a. Administer through PICC or CVC
    b. Infuse 1 L 0.9% NaCl with 20 mEq KCl over 2 hours before each dose of AmB
    c. Premedication: paracetamol, diphenhydramine 30 minutes before infusion
    d. Dilute reconstituted AmBD in 5% DW to obtain a concentration of 0.1 mg AmBD/ml & infuse over 4 hours
    e. Monitoring:
        i. Potassium & creatinine: Baseline and 3 times/week
        ii. Haemoglobin: Baseline and once weekly
    f. If hypokalemia develops, replace potassium; check for hypomagnesemia in refractory hypokalemia
    g. If creatinine increases >2 times baseline, withhold AmB temporarily & restart after return to normal
5. **Prevention of CAM**
    a. Optimum blood sugar control in COVID-19 patients, especially those on steroids
    b. Use steroids ONLY for COVID-19 patients with hypoxemia & use only the recommended dose and duration
    c. Avoid unproven immunosuppressive agents for treating COVID-19