Transient Mucor circinelloides fungemia

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Abstract

*Mucor circinelloides* is a filamentous fungus that causes rare but devastating human infections. It is also a known human colonizer and laboratory contaminant which is tough to grow in blood culture. We present a case of a 48-year-old male presenting with fever, confusion, and hemodynamic instability, ultimately drug-related, complicated by transient *M. circinelloides* fungemia. Blood cultures drawn on separate occasions grew *M. circinelloides* following clinical improvement, likely from intravenous drug use versus nasal septal fracture with the colonization of nasal turbinates. No infectious focus was identified. He received 4 days of liposomal amphotericin B and was discharged home after prolonged observation. This case is a reminder that diagnosis of Zygomycetes infection is based on evidence of tissue invasion and that its growth in blood cultures should be taken seriously, however, it is a poor predictor of the true infection.

Résumé

*Mucor circinelloides* est un champignon filamentieux qui provoque des infections rares, mais devastatinges chez l’humain. Il est également connu pour coloniser l’humain et être un contaminant de laboratoire qui est difficile à faire pousser par hémoculture. Nous présentons le cas d’un homme de 48 ans qui manifeste de la fièvre, une confusion et une instabilité hémodynamique liées au bout du compte à la prise de médicaments et compliquées par une mycose généralisée transitoire causée par *M. circinelloides*. Des hémocultures effectuées à différentes occasions montrent une croissance de *M. circinelloides* à la suite d’une amélioration clinique, probablement attribuable à l’administration de médicaments par voie intraveineuse ou à une fracture de la cloison nasale et de la colonisation des cornets nasaux. Aucun foyer d’infection n’a été trouvé. Le patient a reçu de l’amphotéricine liposomale B pendant quatre jours et a reçu son congé de l’hôpital après une période d’observation prolongée. Ce cas rappelle que le diagnostic d’une infection à zygomycètes repose sur des signes d’invasion tissulaire et que leur croissance dans les hémocultures doit être prise au sérieux, car il s’agit d’un mauvais prédicteur de la véritable infection.

Case Presentation

A 48-year-old male with a history of intravenous drug use (IVDU) and recent traumatic anterior nasal spine and zygomatic arch fractures was brought to the emergency department for confusion. He was febrile and hemodynamically unstable. After blood culture collection, he was empirically treated with ceftriaxone and vancomycin, intubated, and a central line was inserted. Leukocytosis (39.1 × 10⁹/L) was present with neutrophilic predominance. Computer tomography of the head was suggestive of sinusitis. The urine drug screen was positive for opiates, methamphetamine, and amphetamine. He was extubated to room air within 24 hours, and the central line was removed. Blood, cerebrospinal fluid, and urine cultures were negative for bacterial pathogens, so antimicrobials were discontinued. He was diagnosed with sympathomimetic toxidrome and opioid withdrawal.
Two out of the two aerobic peripheral blood cultures flagged positive 45 hours after collection, and Gram stain showed septate fungal elements (Figure 1A), later identified as *Mucor circinelloides*. Liposomal amphotericin B was injected after two additional peripheral blood cultures were drawn. Of this second set, 1/2 aerobic bottles grew *M. r circinelloides*. Transthoracic echocardiogram, chest radiograph, ophthalmologic exam, anterior rhinoscopy flexible endoscopy, and HIV serology were unrevealing. Amphotericin B was discontinued after 4 days. About 32 further bottles of blood cultures were drawn in the 10 additional days of observation with no fungal growth. The portal of entry was assumed to be IVDU versus nasal spine fracture with colonized nasal turbinates. He remained well and was discharged with no known recurrence.

*M. circinelloides* is a filamentous fungus of class *Zygomycetes*. Clinical infection is typically opportunistic with a high mortality rate (96–100% in disseminated infection). Risk factors include hematologic malignancy, diabetes mellitus, and IVDU. Diagnosis is based on evidence of tissue invasion by microscopy, histopathology, or culture. Isolation of zygomycetes in blood cultures is rare (1.9%), and taken alone is inadequate to make a diagnosis. Additionally, growth in clinical specimens does not necessarily indicate infection as specimen contamination, and human colonization is a well-known phenomenon.4

In culture, *Zygomycetes* are broad and aseptate with sporangiophores supporting sporangia (Figure 1B). In histologic sections, they are wide, ribbon-like, hyaline, aseptate hyphae with wide-angle (approximately 90°) branching causing tissue invasion, inflammation, thrombosis, infarction, and necrosis. *Mucorales* shows aerial unbranched and branched large, spherical sporangiophores arising randomly from mycelia, with no rhizoids. *Mucorales* are referred to as “lid lifters” because of proliferative, vertical growth (< 48 hours) of the mycelia (Figure 1B, 2).

References