Species Distribution and Frequency of Antifungal Resistance Variations Among Candida
Bloodstream Infections by Patient Age: Results from the SENTRY Program

MA PFALLER, RN JONES, SA MESSEY, GJ MOET
JMI Laboratories, North Liberty, Iowa, USA

Introduction

Invasive candidiasis (IC) and other deep-seated infections involving disseminated candidiasis, hepatic, endocarditis, and meningitis are associated with considerable morbidity and mortality. The development of effective and appropriate antifungal prophylaxis and therapy is essential for management of IC and has been shown to reduce mortality. The echinocandins (anidulafungin, caspofungin, micafungin) are recommended as first-line therapy for patients with IC with escalation to fluconazole based on the susceptibility of the infecting organism to this agent.

Although much is known regarding the geographic variation in the species of Candida and the associated susceptibilities to the newer azoles and echinocandins, considerably less is understood regarding variation in species susceptibility to the newer antifungals among patient age groups. Therefore, the purpose of this study was to compare antifungal profiles and species distribution of Candida bloodstream isolates from 79 medical centers worldwide from 2008-2009.

Methods

Organisms and study sites: Between January 2008 and December 2009, 1,239 Candida spp. were isolated from 79 medical centers throughout the world were submitted to JMI Laboratories (North Liberty, Iowa, USA) for susceptibility testing. The isolates were identified by standard methods and stored as water purity and viability.

The susceptibility test methods:

- Anidulafungin
- Caspofungin
- Micafungin
- Voriconazole
- Fluconazole
- Posaconazole

were performed in accordance with the guidelines in the Clinical and Laboratory Standards Institute (CLSI) document M27-S2 (CLSI, 2009). Minimal inhibitory concentrations (MICs) were determined using the CLSI broth microdilution (BMD) method. The CLSI breakpoints for anidulafungin, caspofungin, micafungin, voriconazole, fluconazole, posaconazole, and echinocandins were used to identify resistant strains: ANF, CSF, MCF, VRC, and FLC, respectively.

Results

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Conclusions

- Resistance to the systemically active echinocandins and azole antifungal agents was very uncommon among C. albicans, C. parapsilosis, and C. krusei isolates from all age groups.
- A trend toward an increased proportion of BSI isolates of C. glabrata with increasing patient age was noted; and resistance to azoles and echinocandins were found in the isolates from 20 to 39 and 40 to 59 year age groups.
- Although prolonged exposure to antifungal agents may account for some of this increase in resistance, the increase in the overall rate of resistance to fluconazole makes it particularly apt at acquiring resistance mutations.
- These findings point to the importance of antifungal resistance surveillance in both treatment programs and for local patient cases.

References


