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LETTER TO THE EDITOR

Distribution of *Candida* species causing bloodstream infections

Sir,

Recently, Chi et al¹ compared the risk factors and outcomes of bloodstream infections due to *Candida albicans* with those due to non-*albicans* species at a hospital in northern Taiwan in the August 2011 issue of the *Journal of Microbiology, Immunology, and Infection*. In that study, the authors retrospectively enrolled 108 patients with candidemia during the period October 2007 to July 2009. Of those patients, 61 (56.5%) had *C. albicans* bloodstream infections and 47 (43.5%) had non-*albicans* candidemia. The species distributions were as follows: *C. glabrata* ($n = 19$, 17.6%), *C. tropicalis* ($n = 14$, 13.0%), *C. krusei* ($n = 1$, 1%), and *C. haemulonii* ($n = 1$, 1%). Although these findings are interesting, we wondered whether they could be generalized to other parts of Taiwan. Therefore, we performed this study to investigate the species distribution of *Candida* isolates causing fungemia in southern Taiwan.

This retrospective study was conducted at the Liouying branch of the Chi Mei Medical Center, a 900-bed hospital in southern Taiwan. All blood cultures positive for *Candida* species during the period January 2005 to December 2010 were identified in the database of the Microbiology Laboratory of the hospital. Each patient was included only once at the time of detection of the first bloodstream infection. The identifications of *Candida* species were confirmed using the API 20C and Vitek YBC systems (bioMérieux Vitek, St. Louis, MO, USA).

During the study period, a total of 935 blood culture specimens from 407 patients were positive for *Candida* species. The most prevalent species were *C. albicans* ($n = 245$, 60.0%), followed by *C. tropicalis* ($n = 79$, 19.4%), *C. parapsilosis* ($n = 61$, 15.0%), *C. glabrata* ($n = 45$, 11.0%), *C. guilliermondii* ($n = 14$, 3.4%), *C. sake* ($n = 1$, 0.2%), *C. famata* ($n = 1$, 0.2%), and *C. pelliculosa* ($n = 1$, 0.2%). *Candida* species could not be determined in three (0.7%) of the patients. In addition, 36 (8.8%) patients had polymicrobial candidemia with two different *Candida* species. Interestingly, we first identified a case of

C. pelliculosa candidemia that developed in a 72-year-old female patient, who had undergone an operation for duodenal perforation. As part of her treatment, a central venous catheter had been placed for the administration of total parenteral nutrition. Although she responded well to fluconazole and removal of the catheter, she died due to nosocomial infection with multiple organ failure.

There were two significant findings in this study. First, *C. albicans* was the most prevalent *Candida* species causing fungemia in southern Taiwan, a finding consistent with that in northern Taiwan and in other countries.^{1–7} The species distribution of other *Candida* species, however, varied in northern and southern Taiwan, a finding that is also consistent with reports from other countries.^{1–7} For example, in Spain, a nationwide study of 984 episodes of candidemia showed that *C. parapsilosis* (20.7%) was the second most common *Candida* isolate, followed by *C. glabrata* (13.6%), *C. tropicalis* (10.8%), and *C. krusei* (2.1%).² In a study of 107 episodes of candidemia in the UK, *C. albicans* was the most common species, accounting for 43% of the episodes, followed by *C. glabrata* (31%) and *C. parapsilosis* (20%).³ However, several studies, including the present work in southern Taiwan, disclosed that the second most common *Candida* species was *C. tropicalis*.^{4–7} Second, our study is the first to report a case of catheter-related bloodstream infection caused by *C. pelliculosa* in Taiwan.

In conclusion, *C. albicans* is the most important species associated with candidemia. The distribution of non-*albicans Candida* species causing fungemia varies from hospital to hospital and from country to country.

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