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CASE REPORT/CAS CLINIQUE

Analysis on clinical characteristics and drug resistance of *Candida parapsilosis* bloodstream infections in West China Hospital, China, from 2012 to 2015

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KEYWORDS

Candida parapsilosis;
Bloodstream infections;
Clinical characteristics;
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Summary

Objective of the study. – *Candida parapsilosis* has emerged as an important cause of bloodstream infections (BSI) in the health care setting. We aimed to describe the clinical characteristics and drug resistance of *C. parapsilosis* BSI in West China Hospital of Sichuan University in China and provide the basis for prevention and treatment of this disease.

Patients. – We retrospectively collected and analyzed patients presented in our hospital reported with *C. parapsilosis* BSI from January 2012 to January 2015.

Materials and methods. – Data regarding age, gender, the department distribution, the potential clinical risk factors and the result of clinical treatment and prognosis were retrospectively evaluated. As to the antifungal drugs susceptibility testing, we used Etest method for determining the minimum inhibitory concentrations (MICs) of amphotericin B, fluconazole, voriconazole, caspofungin and flucytosine for all the clinical isolates of *C. parapsilosis*. Standard quality strains were used as the controls.

Results. – Most of the patients with *C. parapsilosis* BSI were over 60-year-old (37.5%) or within 10 years old (28.13%). Among patients, 78.13% came from an intensive care unit or had undergone surgery in the past several months. The major risk factors associated with an increased risk of infection included the use of broad-spectrum antibacterial drugs and deep vein indwelling. The overall mortality of patients with *C. parapsilosis* BSI was 31.25%. The drug sensitivity tests revealed that all isolates were sensitive to amphotericin B and flucytosine. Two and 1 isolates were found susceptible to fluconazole and voriconazole in a dose-dependent

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manner, respectively. Only 1 isolate was resistant to fluconazole. 4 isolates (12.5%) were medium sensitive to caspofungin, but no one showed drug resistance.

Conclusion. – In summary, elders and newborns were more vulnerable to *C. parapsilosis* infections. *C. parapsilosis* was found frequently as pathogens leading to BSI in patients admitted to ICU and departments of surgery and often causing a high mortality rate. *C. parapsilosis* rarely showed drug resistance at present, so common antifungal drugs could be used for treatment. Recommendations for using of antifungal drugs focused on paying close attention to possible drug resistance trend.

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Introduction

With the longevity of human beings, the change of disease spectrum and development of medical technology, *Candida* has become a major threat to human health because of the extensive application of various broad-spectrum antibacterial drugs [1–3]. Although *Candida albicans* remains the most common clinical pathogenic fungal, longitudinal studies had detected a trend toward an increasing prevalence of *non-albicans Candida* infections. Among these, *Candida parapsilosis* has currently become one of the three most common pathogenic *Candida* in some regions of Latin America, Canada, Europe and Asia Pacific [4–6]. It has been reported that incidence of *C. parapsilosis* bloodstream infections (BSI) is also rising in China [7]. In order to figure out the clinical characteristic of patients infected by *C. parapsilosis* and the drug sensitivity about those *C. parapsilosis*, we studied the 32 cases of *C. parapsilosis* BSI in West China Hospital from January 2012 to January 2015.

Patients, materials and methods

Clinical data of cases with *C. parapsilosis* BSI in our hospital from January 2012 to January 2015, a total of 32 cases, were collected and analyzed retrospectively. Specimens were isolated from all the blood samples in West China Hospital of Sichuan University, in southwest China's Sichuan province between January 2012 and January 2015. Meanwhile, clinical data of corresponding cases were also collected. In addition, the total of 32 cases corresponds to 32 unliked patients. The ethics committees of West China Hospital approved this study.

Data regarding age, gender, the department distribution, the potential clinical risk factors and the result of clinical

treatment and prognosis were retrospectively evaluated. As to the antifungal drugs susceptibility testing, we used Etest method for determining the minimum inhibitory concentrations MICs (MIC₅₀ and MIC₉₀) of amphotericin B, fluconazole, voriconazole, caspofungin and flucytosine for all the clinical isolates of *C. parapsilosis* according to the manufacturer's recommendations (BioMerieux, France) [8]. Briefly, the colonies were seeded on dishes with RPMI 1640 supplemented with 2% glucose agar and then incubated at 35 °C for 48 h, thus the Etest strips were added and further incubated for 12 h. The profile of the drug sensitivity was classified as sensitive (S), dose-dependent sensitivity (S-DD), intermediate (I), and resistant (R) according to M27-A3 and M27-S3 CLSI standards. The strain of *C. parapsilosis sensu stricto* from American Type Culture Collection (ATCC 22019) was used as the quality control.

Clinical data of *C. parapsilosis* BSI were analyzed retrospectively. Drug sensitivity test were evaluated by MIC₅₀ and MIC₉₀ values, which were calculated by probit regression analysis using SPSS software. These *C. parapsilosis* were collected and identified by CHRO Magar *Candida* culture medium and API20 C AUX system. Furthermore, we had carried ITS sequence analysis assay to determine the strains of *C. parapsilosis*.

Results

Age and department distribution of patients

Among the 32 cases of *C. parapsilosis* BSI, 22 patients were males and 10 patients were females. The span of age distribution was from newborns to 80-year-old as described in Table 1. However, it mainly concentrated in

Table 1 Age and department distribution of *C. parapsilosis* bloodstream infected patients.

Age (years)	Patients	ratio (%)	Department	Patients	ratio (%)
0~10	9	28.13	ICU	13	40.63
11~20	3	9.37	Pediatric surgery	9	28.13
21~30	2	6.25	Neurological Surgery	3	9.37
31~40	2	6.25	Nephrology	1	3.13
41~50	1	3.13	Emergency	3	9.37
51~60	3	9.37	Infectious diseases	1	3.13
> 60	12	37.50	Hematology	1	3.13
			Respiratory disease	1	3.13
Total	32	100.00	Total	32	100.00

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