Background: bloodstream infections (BSI) with uncommon Candida species (UCspp: other than albicans, glabrata, krusei, parapsilosis, tropicalis) in cancer patients are not well-characterized. We evaluated the epidemiology, susceptibility pattern, and factors associated with all-cause mortality, as well as consumption of antifungals.

Methods: We retrospectively reviewed all fungemia due to UCspp between 1996 and 2013 in our cancer center. Results: Candida species were isolated from 2,395 mixed culture specimens during the study period, of these, 191 (50 patients) were due to UCspp. The incidence of BSI from UCspp and their proportion relative to all episodes significantly increased over the study period (P<0.001). UCspp had highest incidences (4.1 episodes per 100 hospital days, 168/100,000 DDD) with Anidulafungin (23.9), and Caspofungin (17.7) during 2006-2013. C. krusei, C. dubliniensis, and C. parapsilosis showed significant association between consumption of echinocandins and incidence (adjusted OR, 7.09, 6.99, and 3.48, respectively). Thirty-two patients (62%) had leukopenia and 64 (46%) were neutropenic (ANC<500/µL). Thirty-seven patients (69%) had bloodstream infections, while isolating echinocandins (31 patients, 57%). C. dubliniensis (31%) had highest crude MDR rates among the epidemiological useful values. C. guilliermondii was more frequently resistant to voriconazole (24%). The crude 30-day mortality rate was 15%, and significantly associated with ICU stay (pH<0.01), persistent neutropenia (WBC <5,000/µL), and high APACHE II score (>19, ≤2, ≤2).

Conclusions: The incidence of BSI from UCspp is increasing in patients with cancer. UCspp are frequently resistant to azoles and echinocandins, and associated with consumption of echinocandins, bloodstream infections and mortality.

Results

Candida species were isolated from 1,395 blood culture specimens during the study period; of these, 191 episodes of fungemia caused by UCspp were detected in patients with cancer. The overall incidence of BSI from UCspp and their proportion relative to all candidemia increased significantly over the study period (Incidence density, Poisson-regression for trend P<0.001; Propensity, Cochran-Armitage trend analysis Pc<0.001, Fig. 1). In comparison with incidence of each UCspp, the incidence of C. lusitaniae, C. kefyr and C. famata significantly increased more than C. guilliermondii between the two periods (P<0.001, Fig. 2).

The analysis revealed a statistically significant association between the increase of annual consumption of echinocandins (DDD) and the increase in incidence density of specific UCspp (C. lusitaniae, C. kefyr, and C. famata; p=0.036, p=0.003, and p=0.011, respectively) in patients with cancer (Fig. 3).

Forty-two patients had leukemia (62%) and 43 (63) were neutropenic (ANC<500/µL). Thirty-seven patients (54%) had an intra-abdominal source (recent abdominal surgery, perforitis, gastrointestinal GVHD, or biliary sepis) (Table1). Thirty-seven patients (54%) had breakthrough infections, most commonly while being treated with an echinocandin (21 patients) (Table2).

C. kefyr (82%) isolates and C. lusitaniae (21%) strains frequently had caspofungin MICs above the epidemiological cutoff values. C. guilliermondii was more frequently resistant to voriconazole (24% of isolates) than other species (Table 2).

The crude 30-day mortality rate was 59% (Table 3) and was significantly associated with persistent neutropenia (adjusted hazard ratio [aHR], 3.0), ICU stay on the day of candida (aHR 4.0), and high APACHE score (aHR 2.19, aHR 2.80) (Table 4).

Conclusions

The incidence of BSI from UCspp is increasing in patients with cancer. UCspp are frequently resistant to azoles and echinocandins, and associated with consumption of echinocandins, bloodstream infections and high mortality rates.

References