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E0172 Candida spp. clinical isolates causing candidaemia show differences in the kinetic parameters

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Background: We studied the potential differences in the growth kinetics among clinically relevant *Candida* species isolates causing candidaemia. Furthermore, we assessed the potential impact of *FKS2* mutations in the kinetic parameters of *C. glabrata*.

Material/methods: A total of 705 isolates from patients with candidaemia caused by susceptible *Candida* spp. [*C. albicans* (n=351), *C. parapsilosis* (n=200), *C. glabrata* (n=83), *C. tropicalis* (n=54), and *C. krusei* (n=17)] admitted to Gregorio Marañón Hospital, Madrid (2007-2017) were studied. *C. glabrata FKS*-mutant isolates (n=32) and fluconazole-resistant isolates (n=10) was also tested. The same adjusted inocula (100 µL of 1-5×10^5 CFU/mL) prepared for EUCAST EDef 7.2. antifungal susceptibility testing of echinocandins and azoles was used for kinetic analysis. Briefly, 100 µL of the suspension were added to double-concentrated RPMI 1640 medium in flat-bottomed microdilution trays and incubated with moderate shaking at 35ºC for 36 hours (performed in triplicate). The optical density in each well was measured every 15 minutes at 490 nm. Differences between kinetic parameters (average growth rate and time to maximum rate) were studied by Kruskal-Wallis and Mann–Whitney tests.

Results: Significant kinetic parameters differences were found among all species, with *C. albicans* and *C. parapsilosis* as those growing slowly (P<0.01) (Table). Average growth rate and time to maximum rate between susceptible *C. glabrata* isolates (7.50×10^{-6} s^{-1} and 6.35×10^4 s) and fluconazole-resistant *C glabrata* isolates (7.98×10^{-6} s^{-1} and 6.39×10^4 s) were similar but higher than those found in echinocandin-resistant isolates (4.59×10^{-6} s^{-1} and 1.04×10^5 s) (P<0.001). Latent phase of *C. parapsilosis* isolates was significantly longer than for the remaining species. All species have an average growth rate that might mirror the time to positivity in blood cultures with the exception *C. glabrata* that paradoxically showed the fastest rate of growth.

Species	Average growth rate (s^{-1}, mean)	Time to maximum rate (s, mean)
C. albicans	3.87×10^{-6}	9.68×10^{4}
C. glabrata	7.50×10^{-6}	6.35×10^{4}
C. parapsilosis	4.35×10^{-6}	9.52×10^{4}
C. tropicalis	6.90×10^{-6}	7.92×10^{4}
C. krusei	6.08×10^{-6}	8.34×10^{4}

Conclusions: Differences in the average growth rate and time to maximum rate among *Candida* spp were found with *C. glabrata* as the fastest growing species. The low average growth rate of *C. glabrata* echinocandin resistant isolates could have an impact of positivity time of blood culture.