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Letter to Editor

Microbiology Section

Antifungal Breakpoints of Non-albicans *Candida* Clinical Isolates in Vitek-2 Compact

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Sir,

The incidence and diversity of infections caused by non-albicans *Candida* species (NAC) have shown a substantial increase in recent years. Given the growing number of susceptible patients with compromised immunity as a consequence of HIV infection, cancer chemotherapy and transplantation associated immunosuppression, NAC has emerged as an eminent fungal pathogen worldwide. Pertaining to the diverse mechanisms of resistance to various antifungals agents among NAC, it has become imperative to identify the effective antifungals. A prospective study was conducted in Department of Microbiology in our tertiary care hospital from May to August, 2014. A total of 36 *candida* isolates (16 *C. albicans*, 11 *C. tropicalis*, 5 *C. krusei*, 2 *C. glabrata* and 2 *C. parapsilosis*) recovered from blood and urine were identified as per standard procedures. The NAC isolates (n=20) were selected for antifungal susceptibility testing (AFST) in Vitek-2 Compact using AST-YS07 card. MIC for fluconazole, voriconazole, caspofungin, micafungin and flucytosine were interpreted [Table/Fig-1] as per CLSI guideline [1]. Among the various AFST methods currently in use for yeasts, macrobroth dilution, microbroth dilution and disc diffusion tests are recommended by CLSI [2]. However, the utility of these tests are limited by the technically challenging procedure, difficulty of inoculums standardization and subjective variation in interpretation. Unlike bacterial pathogens, the slow growth rate of *candida* also precludes a short turnaround time. Early initiation of appropriate therapy is a critical factor determining the clinical outcome. The introduction of automated AFST has ensured prompt results in a standardized platform. However, there is a lack of published data of fungal resistance pattern determined by automated system in India. In this study, the mean analysis time for determining antifungal susceptibility by Vitek-2 Compact was 14.15 ± 2.49 hour. Vitek-2 utilizes a self-calibrating optic system comprising of light emitting diodes and photo detectors to continually monitor the growth of organisms inside the wells of the test cards, reducing the analysis time [3]. All five *C. krusei* isolates had fluconazole and flucytosine resistance with MIC > 8µg/dl. Two *C. tropicalis* strains showed fluconazole resistance and one had intermediate susceptibility to flucytosine. The median MICs for fluconazole, voriconazole, caspofungin, micafungin and flucytosine among *C. tropicalis* were 1, 0.12, 0.25, 0.06 and 18µg/dl respectively. In *C. krusei* the median MICs for these drugs were 16, 0.12, 0.25, 0.12 and 8µg/dl respectively. Our findings are in accordance with other studies. Tellapragada et al., found all NAC isolates except *C. krusei* were uniformly sensitive to fluconazole, while one *C. parapsilosis* and one *C. tropicalis* strain displayed voriconazole and caspofungin resistance respectively [4]. Echinocandins are novel synthetic lipopeptide antifungals which non-competitively inhibit the fungal β [1,3]-D-glucan synthase enzyme [5]. Echinocandin resistance among NAC species have been mainly reported in *C. parapsilosis* with FKS1 mutation [5]. In our study, caspofungin and micafungin were sensitive in all isolates, indicating their critical role in treatment of infections by azole resistant strains. However, further study with a larger sample size comparing Vitek-2 Compact results with other methods of MIC testing is required to confirm our findings. In conclusion, Vitek-2 Compact is essential in rapid determination of antifungal susceptibility of *candida*. However, the cost constraints may deter its incorporation in routine diagnostic protocol in resource poor settings.

Candida spp	Fluconazole			Flucytosinee		
	Sensitive	Intermediate	Resistant	Sensitive	Intermediate	Resistant
C. tropicalis (n=11)	9	0	2	10	1	0
C. krusei (n=5)	0	0	5	0	0	5
C. glabrata (n=2)	2	0	0	2	0	0
C. parapsilosis (n=2)	2	0	0	2	0	0

[Table/Fig-1]: Resistance pattern of non-albicans *candida* isolates
All isolates were uniformly sensitive to voriconazole, caspofungin and micafungin

REFERENCES

[1] Clinical and Laboratory Standards Institute. 2012. Reference method for broth dilution antifungal susceptibility testing of yeasts. Fourth informational supplement M27-S4. Clinical and Laboratory Standards Institute, Wayne, PA.

[2] Pfaller MA, Diekema DJ. Progress in antifungal susceptibility testing of *Candida* spp. by use of Clinical and Laboratory Standards Institute broth microdilution methods, 2010 to 2012. *J Clin Microbiol*. 2012;50:2846-56.

[3] Vitek-2 Compact instrument user manual. Marcy l'Etoile, France: BioMérieux; 2009. pp. 170.

[4] Tellapragada C, Eshwara VK, Johar R, Shaw T, Malik N, Bhat PV, et al. Antifungal susceptibility patterns, in vitro production of virulence factors, and evaluation of diagnostic modalities for the speciation of pathogenic *Candida* from blood stream infections and vulvovaginal candidiasis. *J Pathog*. 2014;142864:7.

[5] Espinel-Ingroff A. Mechanisms of resistance to antifungal agents: yeasts and filamentous fungi. *Rev Iberoam Micol*. 2008;25:101-06.

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