www.jmscr.igmpublication.org Impact Factor 3.79
ISSN (e)-2347-176x

Journal Of Medical Science And Clinical Research
IGM Publication An Official Publication Of IGM Publication

Coagulase Activity in Clinical Isolates of Candida

Authors
Dipak Thamke[1], Vijay Ambade[2]
Dept of Microbiology, MGIMS, Sevagram
Email:*dipak.thamke@gmail.com*

INTRODUCTION

Candida have exploded into prominence in recent years as opportunistic and nosocomial fungal pathogen.[1] Several virulence factors like adhesion, hyphal formation, cell surface hydrophobicity, biofilm formation, proteinase secretion, phospholipase secretion, coagulase production and phenotypic switching[2-4] contribute to its pathogenesis. Plasma coagulase, is an enzyme that binds plasma fibrinogen and activates a cascade of reactions that induce plasma to clot.[5] It catalyses conversion of prothrombin to thrombin and is considered as potential enhancer of virulence of *Candida albicans.*[6] Research in *Candida* has focused on enzymes such as secreted aspartyl proteinases, phospholipases and haemolysins. Systematic studies correlating source of candida isolation and plasma coagulase expression are rare.[5,7]

Therefore the present study was undertaken with objective to detect the coagulase activity of candida species isolated from various clinical specimens.

SUBJECTS AND METHODS

A total of 119 *Candida strains* isolated from stool, urine, high vaginal swab, sputum, blood representing five different species *C. albicans* (71), *C. tropicalis* (21), *C. parapsilosis* (17), *C. krusei* (09), and *C. guilliermondii* (01) were included in the study. The isolates were identified by standard diagnostic procedures (germ tube production, chlamydospore formation and sugar assimilation)[7.] Approximately 0.1 ml of an overnight culture of each test strain in Sabouraud-dextrose broth was inoculated into a tube containing 500 ml of EDTA-rabbit plasma (Difco Laboratories, Detroit, Mich.). *Staphylococcus*

aureus ATCC 25923 and *Staphylococcus epidermidis* ATCC 35984 were used as positive and negative controls for coagulase production. The tubes were incubated for 4 hours at 35°C.

Coagulase production was assessed by the presence of a clot that could not be resuspended by gentle shaking. If no clot was formed, the tubes were reincubated and reexamined after 24 hours.[8]

RESULTS

Table1 summarizes the Coagulase activity of various Candida species.

Table 1: Coagulase in various *Candida* species

Candida sp.	No. of isolates	Coagulase n (%)	
		Positive	Negative
C. albicans	71	38 (53.52)	33 (46.47)
C.tropicalis	21	08 (38.00)	13 (61.90)
C. parapsilosis	17	7 (41.17)	10 (58.82)
C. krusei	9	2 (22.22)	7 (77.77)
C. gulliermondi	1	00	1 (100)
Total	119	55 (46. 21)	64 (56.25)

The coagulase activity was higher in *C. albicans* (38/71; 53.52%) than non-albicans *Candida* (17/51; 35.41%). The only isolate of *C. guillermondii* studied was found to be negative for coagulase.

DISCUSSION

Coagulase production by *Candida* species was first reported by Rodrigues et al, who detected high coagulase activity in *C. albicans* (88.5%) and *C. tropicalis* (82.6%), but lower activities in other species using the coagulase tube test with rabbit plasma after incubation for 24 hours.[5] In the present study, 46% of *Candida* isolates showed coagulase production and higher activity was noted in *C. albicans* (53.52%) than non-albicans *Candida* (35.41%). In the study by Yigit et al, 64.7% C. *albicans* exhibited coagulase production in the tube coagulase test with rabbit plasma which was higher than that of *C. glabrata*(30.0%), *C. krusei*(22.2%), *C. kefyr* (42.8%) strains and *C. parapsilosis* (40.0%) strains.[9] In study by Rodrigues et al[5] none of the *C. krusei* was able to produce coagulase. However, two strains of *C. krusei* in our study were coagulase positive. In our study, we could not find correlation between the source of Candida isolation and the coagulase activity. Similar finding is reported by Rodridge A G et al study.[5] Variations in expression of coagulase in different species of Candida with their different sources of origin may be atributable with specific characteristics of *Candida* isolates, such as geographical origin or type of infection, site and stage of infection and the nature of the host response. However as coagulase activities in *Candida* species as virulence factor is less well studied, its importance to pathogenicity requires new and more rigorous studies.

REFERENCES

1. Centers for Disease Control and Prevention. Monitoring hospital acquired infections to promote patient safety in the United States, 1990-1999. Morb. Mortal Wkly Rep.2000;49:149-153.
2. Cotter, G. and Kavanagh, K. Adherence mechanisms of Candida albicans. Br J Biomed Sci 2000; 57:241-9.
3. Calderone R A, Fonzi W A. Virulence factors of *Candida albicans*. Trends Microbiol 2001; 9:327-35.
4. Mohandas V, Ballal M. Distribution of *Candida* Species in different clinical samples and their virulence: Biofilm formation, proteinase and phospholipase production: A study on hospitalized patients in Southern India. J Global Infect Dis 2011; 3:4-8.
5. Acacio Gonclaves Rodrigues, Cidalia Pina-Vaz, Sofia Costa de-Oliveira, and Christina Tavares. Expression of plasma coagulase among pathogenic candida species. J Clin. Microbiol. 2003; 41(12):5792-5793.
6. Nadejda A Ziakina AND Elinov NP. Fungal plasmacoagulase. Mycopathol Mycol. 1968; 35:10-16.
7. Becker K, Almasri AS, von Eiff C, *et al*: Systematic survey of nonspecific agglutination by *Candida* spp. in latex assays. *J Clin Microbiol* 2007; 45: 1315 – 1318.
8. Isenberg, H. D. (ed.). 1998. Essential procedures for clinical microbiology.ASM Press, Washington, D.C.
9. Nimet Yigit, Esin Aktas, Saadettin Dagistan, Ahmet Ayyildiz. Biofilm Production, Coagulase and Hemolytic Activity in *Candida* Species. EAJM 2011; 43: 27-32.