Research Paper

Volume : 1 | Issue : 7 | Dec 2012 • ISSN No 2277 - 8179

Prevalence of Candida in Sputum of Patients with Respiratory Disease in Jamnagar Region

Medical Science

KEYWORDS : Candida albicans, Candida non-albicans, sputum

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ABSTRACT

BACKGROUND: Candida is unicellular yeast like fungi. It present as normal commensals in body. Body immune system can control Candida infection. Damage to immune system will invite Candida infection. Candida infection is mostly endogenous and rarely exogenous from inanimate objects. AIMS: Present study was conducted to identify Candida spp. more specifically Candida non albicans in sputum of patients with respiratory diseases. METHODS: Total 444 samples were tested by gram stain, culture and other identification methods. 289 were male patients and 155 were females. RESULTS: 127 samples were identified positive for Candida spp. Predominant pathogen identified in study was C. tropicalis (42.52%) followed by C. albicans (28.35%), C. glabrata (11.81%) C. parapsilosis (7.08 %), C. kefyr (5.51 %) and C. krusei (4.73 %) CONCLUSION: Presence of Candida in sputum create confusion between actual pathogen and contamination from oropharyngeal secretion, it required clinical correlation.

INTRODUCTION:

Fungi are ubiquitous organisms [1]. Incidence of fungal infections has increased in last few decades [2,3]. Fungal presence in sputum is encountered more and more in today's practise [1]. It increased morbidity and mortality. Invasive fungal infection increases two fold risk of death than bacterial infection [3]. Unfortunately we are not able to identify all fungal pathogens. Present study was conducted to identify Candida prevalence in human sputum with respiratory diseases, more specifically Candida non albicans than Candida albicans.

Candida is unicellular yeast like fungus with hyphae and pseudohyphae [4,5,6]. It present as normal commensals over skin, in intestine, oral cavity, respiratory tract, vagina and other body part [7,8]. There are several species of Candida which includes C. albicans, C. tropicalis, C. glabrata, C. parapsilosis, C. krusei, C. kefyr, C. viswanathii, C. guilliermondi, C.stellatoidea, C. dubiliansis, C. lusitaniae etc [5,6,9]. Our immune system is able to control Candida infection in lungs. Host factors which includes diabetes, malnutrition, over use of antibiotics, steroid therapy, HIV-AIDS, cancer treatment with radiation and chemotherapy, bone marrow or organ transplantation etc. are able to lower immunity and invite Candida infection [1,9,10]. Candida infection is mostly endogenous in nature [11]. In some individual it is exogenous in nature and they acquire the infection from cloths, floor, air and other inanimate objects [10]. It spread its infection by its virulence factors like adhesion protein, fibronectin, hydrophobic molecules, toxins and enzyme production, ability to bind complement receptors, fungal dimorphism, phenotypic switching and bio films formation [9,12,13].

Presence of Candida spp. in sputum is suggesting either actual pathogen or contamination from oropharyngeal secretion [14]. However Candida presence in sputum can't be neglected it required proper sample collection without mixture of oropharyngeal secretion, clinical correlation, proper diagnosis and actual treatment.

MATERIALS AND METHODS:

Total 444 samples were tested over a period of 10 months (JANUARY 2012 TO OCTOMBER 2012) in microbiology department, Shri M P S Medical College, Jamnagar (Gujarat state).

Sample collection: Before sample collection all patients are advised to clean the mouth with distilled water to avoid Candida contamination from oral cavity. All samples were collected in sterile containers with wide open mouth.

Methods:

Step 1: Gram stain and microscopy was performed from sputum to identify gram positive yeast cells, budding yeast cells, hyphae and pseudohyphae.

Step 2: Culture was obtained on two different plates of Sabouraud Dextrose Agar (SDA) with antibiotics (chloramphenicol and cycloheximide). One plate was incubated at room temperature (25.c- 28.c) for mycelia phase growth while other at 37.c for yeast phase. Each plate was examined for Candida growth every 3rd day for a period of three weeks before declared negative.

Step 3: All the culture growth were identified by following different methods.

Culture characteristics showing creamy white colony, slide culture technique to view undisturbed morphology of Candida spp., Lacto phenol Cotton Blue (LCB) for detail microscopy study of Candida spp., germ tube test to differentiated Candida albicans from Candida non albicans, Dalmau technique on corn meal agar to identify chlamydospores production, sugar assimilation- fermentation test for Candida spp. differentiation.

RESULTS:

Table 1 Distribution of Candida species.

Candida species	Positive case	% (n=127)
C. tropicalis	54	42.52 %
C. albicans	36	28.35 %
C. glabrata	15	11.81 %
C. parapsilosis	9	7.08 %
C. kefyr	7	5.51 %
C. krusei	6	4.73 %
Total	127	100 %

Table 1 shows that Predominant pathogen identified in study was C. tropicalis (42.52%) followed by C. albicans (28.35%), C.glabrata (11.81%) C. parapsilosis (7.08 %), C. kefyr (5.51 %) and C. krusei (4.73 %)

Table 2 Distribution of samples according to age and sex

Age	Male %	Female %
6-20	21 4.73%	14 3.15%
21-40	61 13.74%	54 12.16%
41-60	143 32.21%	72 16.22%
61-80	63 14.19%	15 3.38%
>80	1 0.22%	0 0.00%
Total	289 65.09%	155 34.91%

Table 2 indicates that male (65.09%) suffered almost double than female (34.91%) with respiratory diseases. Common age group involved in study was 41-60 years which comprise 48.43% (215 cases-Male 32.21 % + female 16.22 %) patients of total study.

Table 3 Distribution of positive cases

Age	Male %	Female %
6-20	8 6.3%	3 2.36%
21-40	13 10.24%	15 11.81%
41-60	37 29.13%	32 25.20%
61-80	16 12.60%	3 2.36%
>80	0 00.00%	0 00.00%
Total	74 58.27%	53 41.73%

Table 3 shows Candida identified more in male (58.27 %) than female (41.73 %). Male to female ratio in positive cases was 1.39:1. Common age group infected by Candida was 41-60 years of age.

DISCUSSIONS:

Total 444 samples were tested from which 127 (28.60%) samples were identified as positive for Candida species. Most common pathogen identified was C. tropicalis (42.52%) followed by C. albicans (28.35%), C.glabrata (11.81%), C. parapsilosis (7.08 %), C. kefyr (5.51 %) and C. krusei (4.73%). Study indicates that Candida non albicans is more prevalent than Candida albicans. It may be due to resistant to azoles group [3,15,16].

In current study male (65.09%) suffered almost double than female (34.91%) with respiratory diseases. Candida identified more in male (58.27 %) than female (41.73 %) may be due to history of chronic smoking which damage local immunity of lungs. In our study male to female ratio was 1.39:1 which is lower than previous study [17].

In our study most common age group infected by Candida was 41-60 years of age. In some study it is common between 71-80 years. [17]. It is common in older age may be due to presence of immunosuppressive condition like HIV-AIDS, diabetes etc.

CONCLUSIONS:

Presence of Candida in sputum is indicating either actual pathogen or contamination of oropharyngeal secretion, it required clinical correlation. Study suggesting that all patients suffered with respiratory diseases and immunosuppressive condition required fungal screening. Study also emphasizes to improve lungs immunity by avoiding smoking and other risk factors.

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