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A Prospective Research on Cutaneous Candidiasis from a Tertiary Health Care Unit

B. Nirmala Grace [1], T Jaya Chandra [2]

[1]Designated Associate Professor, Department of Microbiology, Guntur Medical College, Guntur
[2]Professor, Department of Microbiology, GSL Medical College, Rajahmundry, Andhra Pradesh

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Corresponding author: Dr. T Jaya Chandra
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Abstract

Introduction: A study was conducted to study various Candida isolates causing skin infections.

Materials and methods: Study was conducted in the department of Microbiology, GSL Medical College, Rajahmundry. Individuals aged ≥18 years with skin infections were included in the study. Individuals who did not submit the consent, those who are on treatment were not considered. First the infected skin was disinfected thoroughly using alcohol. After drying, clinical sample was collected by using sterile swabs from the infected area. In the laboratory, the swabs were inoculated in Sabourauds dextrose agar (SDA) slants and incubated at 37^0C for a week and identification as per the standard protocol. The data was analysed using SPSS version 21, chi square test was used to find the statistical significance, P<0.05 was considered statistically significant.

Results: Candida was isolated in 121 (100%) samples. In the culture positive (CP) cases, 57% the female male ratio was 1.3. Statistically there was no significant difference. Age wise, CP results were more in 39 – 68 years age group. Out of 77 (100%) isolates, 43% were Candida albicans and 57% were non albicans candida.

Conclusions: Cutaneous candiasis common among female and age group 39 – 68 is prevalent for candidiasis.

keywords: Candida, gender, isolate, participant

Introduction

Skin, the outermost covering of the body surface is the main cause for the innate immunity. Here we should considerer the skin microbiota also an important contributory factor for the natural immunity by preventing the colonization of the pathogens. The complex biosystem called skin consist of various floral groups namely bacteria, viruses and fungi. Malassezia, Rhodotorula, Cryptococcus and Candida are the common skin flora. [1]

Not only on the skin, mucosa such as genitourinary tract, oral cavity and gastrointestinal tract also colonized by the Candida members. [2] Candida is a yeast fungus, reported to be an important and more frequent cause for the opportunistic infection due to indiscriminate usage of antibiotics, organ transplantation, prolonged hospital stays, exposure to some invasive procedure and so on. [3, 4]

Candida is responsible for different kind of infections namely blood stream infections, disseminated infections, meningitis, mucocutaneous candidiasis. Only limited studies are available from Indian subcontinent on this killer and candedemia was reported to be 6 – 18%. [5, 6, 7] Whereas the western studies mentioned that the incidence rate of candidemia is to be 6.9 per 1000 in intensive care unit (ICU) patients. [8, 9] Chronic mucocutaneous candidiasis is an impotent cause for significant morbidity. [10, 11] With this a study was conducted to study various Candida isolates causing skin infections.

Materials and Methods:

Study was conducted in the department of Microbiology, GSL Medical College, Rajahmundry from January to May 2021. The study protocol was approved by the institutional ethical committee. An informed written consent was taken from all the participants. Individuals aged ≥18 years with skin infections were included in the study. Individuals who did not submit the consent, those who are on treatment were not considered.

First the infected skin was disinfected thoroughly using alcohol. This helps in removing the bacterial flora which may inhibit the growth of the fungal pathogens on culture media. After drying, clinical sample was collected by using sterile swabs from the infected area. Then the sample was transported immediately to the microbiology laboratory. In the laboratory, the swabs were inoculated in Sabourauds dextrose agar (SDA) slants and incubated at 37^0C for a week.

During the incubation, if there was any growth in the form of creamy, white, moist and pasty colonies, then it was processed for identification as per the standard protocol. [12] First growth was identified under gram staining, presence of gram positive, oval budding yeast cells in the significant finding. Then germ tube test, growth at 45^0C and chlamydosore formation tests were used to differentiate C.albicans from non albicans candida (NAC) members. The data was analyzed using SPSS version 21, chi square test was used to find the statistical significance, $P<0.05$ was considered statistically significant.

Results

During the study period total 166 (100%) participants were included in the study. In this 92 (55%) were female and 74 (45%) were male participants, female male ratio was 1.24. In this, Candida was isolated in 121 (100%) samples. In the culture positive (CP) cases, 69 (57%) were female and 52 (43%) were male participants and the male female ratio was 1.3 (Table 1). Statistically there was no significant difference between gender and culture results.

Table 1: Gender wise culture results among the study participants; n (%)

Gender	CP	CN	Total
Male	52 (43)	22 (49)	74 (45)
Female	69 (57)	23 (51)	92 (55)
Total	121 (100)	45 (100)	166 (100)
Statistical analysis	Chi square value = 0.4622; P value = 0.482621. Statistically not significant.		
CP: Culture Positive; CN: Culture Negative			

Age wise, in male, CP results were 8% (9) in 19 – 28 years group, 7% (8) in 29 – 38 years group, 9% (11) in 39 – 48 years group, 9% (11) in 49 – 58 years group, 10% (12) in 59 – 68 years group and 6% (7) in ≥ 69 years group. CP results among the female was 6% (7) in 19 – 28 years group, 6% (7) in 29 – 38 years group, 10% (12) in 39 – 48 years group, 12% (14) in 49 – 58 years group, 11% (13) in 59 – 68 years group and 9% (11) in ≥ 69 years group. Totally, 13% (16) were CP in 19 – 28 years group, 12% (15) in 29 – 38 years group, 17% (22) in 39 – 48 years group, 21% (25) in 49 – 58 years group, 21% (25) in 59 – 68 years group and 15% (18) were CP in ≥ 69 years group.

Table 2: Age wise distribution of the CP study participants among the gender; n (%)

Age	Male	Female	Total
19 – 28	9 (8)	7 (6)	16 (13)
29 – 38	8 (7)	7 (6)	15 (12)
39 – 48	10 (8)	12 (10)	22 (17)
49 – 58	11 (9)	14 (12)	25 (21)
59 – 68	12 (10)	13 (11)	25 (21)
≥ 69	7 (6)	11 (9)	18 (15)
Total	52 (43)	69 (57)	121 (100)

Total 77 (100%) candida were isolated; 43% (37) were Candida albicans (CA) and 57% (40) were non albicans candida (NAC). Gender wise, 21% (16), 25% (19) were CA, NAC and among the female, 27% (21) each were CA and NAC respectively. Statistically there was no significant difference (Table 3).

Table 3: Gender wise distribution of Candida isolates among the study participants; n (%)

Gender	CA	NAC	Total
Male	16 (21)	19 (25)	35 (45)
Female	21 (27)	21 (27)	42 (55)
Total	37 (43)	40 (57)	77 (100)
Statistical analysis	Chi square value = 0.211; P value = 0.72212. Statistically not significant.		
CA: Candida albicans; NAC: Non albicans candida			

Discussion:

As per the available studies, NAC infections being increased nowadays. [13, 14] Increased laboratory affords should be prioritized here for more isolation of NAC. In this study, among the gender, the CP results were 57%, 43% respectively in female and male. In the CP cases, the male female ratio was 0.75. In a study by Narain U and Bajaj AK, among the CP cases, 9.77% were Candida isolates. [15] In this research more Candida infection was due to inclusion of symptomatic cases.

Gender wise, in this report, female predominance was diagnosed, female male ratio was 1.3. In the available studies, there was difference of report among the gender in cutaneous candidiasis. In one report by Bokhari et al. female predominance was reported whereas another report by Elewski and Cohen et al. candida prevalence was reported to be high in male. [16, 17, 18] The exact reason for this difference was not mentioned in the literature. But most of the study participants were daily workers and paddy cultivation is their main occupation. Usually the female were involved in plantation of paddy in the wet lands and during the day mostly they immerse hands in water. This could be the important reason for more female CP results in this study. In a study by Felea et al. among the children with symptomatic cutaneous candidiasis, CP results were 85%. [19]

Age wise, in this study CP results were more (57%; 68) in 39 – 68 years age group. Usually 39 – 58 years group is more actively involved in the cultivation process and beyond this, may be the defect in host immunity is the cause for increased CP results. The age difference in this study correlates with the available Indian reports. [20, 21] But the reasons were not mentioned by the authors in these reports. The mean age of the CP members in this study was 42.6 years. Whereas this was reported to be 46.11 years by Vella Zahra L et al. [22]

In this report total 77 (100%) candida species were isolated. In this, 43% were CA and 57% were NAC. Statistically there was no significant difference between the gender and candida isolate. Our study findings were similar to that of Ellabib MS et al. [23] in this the CA were reported in 33.8% (96) cases whereas 66.2% (188) were NAC.

Cutaneous candiasis is common among the female and age group 39 – 68 years is more prevalent for candidiasis. NAC was commonly isolated fungi. In this study, immunosupression was not considered. Adding to this, small sample size, non-considering the site of infections are the limitations of this research.

References:

1. Keisha Findley, Julia Oh, Joy Yang, Sean Conlan, Clayton Deming, Jennifer A. Meyer et al. Topographic diversity of fungal and bacterial communities in human skin. Nature 2013; 498: 367 – 370.
2. Kashem SW and Kaplan DH. Skin immunity to Candida albicans. Trends in Immunology 2016; 37: 440 – 450.
3. Messer SA, Jones RN, Fritsche TR. International surveillance of Candida spp. and Aspergillus spp.: report from the SENTRY

antimicrobial surveillance program. J Clin Microbiol 2006; 44(5): 1782 – 7.
4. Richardson M, Lass-Flörl C. Changing epidemiology of systemic fungal infections. Clin Microbial Infect 2008; 14(4): 5 – 24.
5. Magill SS, Shields C, Sears CL, Choti M, Merz WG. Triazole cross-resistance among Candida spp.: case report, occurrence among bloodstream isolates, and implications for antifungal therapy. J Clin Microbiol 2006; 44(2): 529 – 35.
6. Xess I, Jain N, Hasan F, Mandal P, Banerjee U. Epidemiology of candidemia in a tertiary care centre of north India: 5-year study. Infection 2007; 35(4): 256 – 9.
7. Kothari A, Sagar V. Epidemiology of Candida bloodstream infections in a tertiary care institute in India. Indian J Med Microbiol 2009; 27(2): 171 – 2.
8. Kett DH, Azoulay E, Echeverria PM, Vincent JL; Extended Prevalence of Infection in ICU Study (EPIC II) Group of Investigators. Candida bloodstream infections in intensive care units: analysis of the extended prevalence of infection in intensive care unit study. Crit Care Med. 2011; 39(4): 665 – 70.
9. Azoulay E, Dupont H, Tabah A, Lortholary O, Stahl JP, Francais A, et al. Systemic antifungal therapy in critically ill patients without invasive fungal infection. Crit Care Med. 2012; 40(3): 813 – 22.
10. Kirkpatrick CH, Hill HR. Chronic mucocutaneous candidiasis. Pediatr Infect Dis J 2001; 20: 197 – 206.
11. Lilic D, Gravenor I. Immunology of chronic mucocutaneous candidiasis. J Clin Pathol 2001; 54: 81 – 3.
12. Chandra TJ, Subha Mani, Venkateswar rao A. A study on isolation and identification of nosocomial infections causing bacteria on mobile phones of health care workers. Calicut medical journal 2011; 9 (1): e2.
13. Colombo AL, Guimarães T. Epidemiologia das infecções hematogênicas por Candida spp. Rev Soc Bras Med Trop 2003; 36: 599 – 607.
14. Kumar CP, Sundarajan T, Menon T, Venkatadesikalu M. Candidosis in children with onco hematological studies in Chennai, South India. Jpn J Infect Dis 2005; 58(4): 218 – 21.
15. Narain U, Bajaj AK. Candida onychomycosis: Indian scenario. Int J Adv Med 2016; 3: 638 – 42.
16. Cohen JL, Scher RK, Pappert AS. The nail and fungus infections In: B. Elewski (ed.), Cutaneous fungal infections. New York: Lgaku-Shoin. 1992:106 – 22.
17. Bokhari MA, Hussain I, Jahangir M, Haroon TS, Aman S, Khurshid K. Onychomycosis in Lahore, Pakistan. Int J Dermatol 1999; 38: 591 – 5.
18. Elewski BE. Onychomycosis: Pathogenesis, Diagnosis, and Management. Clinl Microbiol Rev 1998; 11: 415 – 29.
19. Felea, D., Ma. ta. saru, S., Nistor, S., Miha. ilescu, L., Petroaie, A., Cosmescu, A., Barbacariu, L., Momanu, O., Sla. nina. , A. M. & Maxim, V. [Aspects of the children's candidiasis in outpatient practice]. Rev Med Chir Soc Med Nat Iasi 2004; 108: 151 – 154.
20. Verma AK, Prasad KN, Singh M, Dixit AK, Ayyagari A. Candidaemia in patients of a tertiary health care hospital from north India. Indian J Med Res 2003; 117: 122 – 8.
21. Hajjeh RA, Sofair AN, Harrison LH, Lyon GM, Arthington-Skaggs BA, Mirza SA, et al. Incidence of bloodstream infections due to Candida species and in vitro susceptibilities of isolates collected from 1998 to 2000 in a population-based active surveillance program. J Clin Microbiol 2004; 42(4): 1519 – 27.
22. Vella Zahra L, Gatt P, Boffa MJ, Borg E, Mifsud E, Scerri L, et al. Characteristics of superficial mycoses in Malta. Int J Dermatol 2003; 42: 265 – 71.
23. Ellabib MS, Agaj M, Khalifa Z, Kavanagh K. Yeasts of the genus Candida are the dominant cause of onychomycosis in Libyan women but not men: results of a 2-year surveillance study. Br J Dermatol 2002; 146: 1038 – 41.