https://doi.org/10.29309/TPMJ/2022.29.06.4602

The Professional Medical Journal
www.theprofesional.com
2022, Volume, 29 Issue, 06

ORIGINAL ARTICLE

Prevalence of Candida albicans isolated from High vaginal swab among Gynae/ Obstetrics patients in Sheikh Zayed Hospital Rahim Yar Khan.

Muhammad Shahbaz Hussain[1], Umar Khalid Cheema[2], Aamir Ashaq[3], Muhammad Sajjad[4], Maryam Habib[5], Mehwish Anwar[6]

Article Citation: Hussain MS, Cheema UK, Ashaq A, Sajjad M, Habib M, Anwar M. Prevalence of Candida albicans isolated from High vaginal swab among Gynae/Obstetrics patients in Sheikh Zayed Hospital Rahim Yar Khan. Professional Med J 2022; 29(6):888-894. https://doi.org/10.29309/TPMJ/2022.29.06.4602

ABSTRACT… Objective: To determine the prevalance of Candida albicans amongst patients attending the Gynae& Obstetrics Department at Sheikh Zayed Hospital, Rahim Yar Khan (SZH-RYK). **Study Design:** Convenience Sampling Technique. **Setting:** Department of Pathology, SZH-RYK. **Period:** November 2018 to February 2019. **Material & Method:** The data on vaginal swabs were collected from different women with symptoms of vaginal infection, cultured on Sabouraud Dextrose agar. For identification of the isolated organisms,colony morphology, wet preparation, Gram staining procedure, a Germ tube test was carried out. A proforma was designed with the help of the supervisor includes various variables. **Results:** Out of 215 HVS samples, about 125 of Candida spp. were isolated, C. Albicans isolated was 64% while yeast other than C. Albicans isolated was 36%. 26-30 years age group had a higher percentage of 65.6% of C. Albicans. Prevalence of C. Albicans was highest in pregnant women 43.2% especially in third trimester 55.6%. The pruritus was found to be 77.9%, the cheesy discharge was found to be 73.9%, prevalence among diabetic women was highest 52.0% and prevalence among antibiotic users was also highest 45.0%. **Conclusion:** This study concluded that pruritus as a key symptom of VVC and prevalence of C. Albicans among pregnant women is more than in non-pregnant women.

Key words: Candida Albicans, Cheesy Discharge, Germ Tube Test, High Vaginal Swab, Vulvovaginal Candidiasis.

INTRODUCTION

The vagina contains a mixture of microorganisms.[1] Females are highly subjected to the urinary tract and vaginal infections as their urethra are very small and due to proximity in their anal canal.[2]
A variety of pathogens can infect the vagina, including bacteria, viruses, parasites and fungi. Vaginal complaints i.e. Bacterial Vaginosis, Trichomoniasis, Chlamydia trachomatis infections and Candidiasis, are more common among women of reproductive age, with high occurrence during pregnancy.[3]

Lactobacillus spp. occupies the vagina of a woman, that is healthily menopausal[4] Lactic acid made by lactobacilli sustains the typical vaginal pH of 3.8 to 4.5, and prevents the bacterial adherence to vaginal epithelial cells. Estrogen supports the vaginal epithelium of normal women which results in the accumulation of glycogen which in turn helps to maintain the pH of the vagina.[5]

Candida spp. are the residents of lower genital tract flora in about 20 to 50% of healthy symptomatic women.[6] Candida albicans cause vaginitis, thrush, esophagitis, chronic mucocutaneous candidiasis, candidemia, rightsided endocarditis and endophthalmitis. It is also related to infections of indwelling intravenous and urinary catheters.[7]

Candidal infections can become harmful to life for the persons who have AIDS, patients admitted for major surgery and organ replacement in Intense Care Units. Patients are experiencing cancer treatment by chemotherapy and radiotherapy.[8] Almost 70 to 90% of the vaginal candidiasis is carried out by Candida albicans.[9]

1. MBBS, M.Phil (Microbiology), Associate Professor and HOD Pathology, Sheikh Zayed Medical College, Rahim Yar Khan.
2. MBBS, M.Phil (Microbiology), Assistant Professor Pathology, Sheikh Zayed Medical College, Rahim Yar Khan.
3. MBBS, M.Phil (Microbiology), Assistant Professor Pathology, Nishtar Medical University, Multan.
4. MBBS, Demonstrator Pathology, Sheikh Zayed Medical College, Rahim Yar Khan.
5. MLT, Medical Technologist Pathology, Sheikh Zayed Medical College, Rahim Yar Khan.
6. MBBS, Demonstrator, Sheikh Zayed Medical College, Rahim Yar Khan.

Correspondence Address:
Dr. Muhammad Shahbaz Hussain
Department of Pathology,
Sheikh Zayed Medical College, Rahim Yar Khan.
drmshahbaz@szmc.edu.pk

Article received on: 20/04/2020
Accepted for publication: 15/01/2021

About 13 million cases of Vulvovaginal candidiasis (VVC) arise yearly in the United States alone and 10 million gynecologic office appointments. Vulvar pruritus is the most frequent symptom, which is present in nearly all symptomatic women. Vulvovaginal candidiasis (VVC) typically described as white “cottage cheese” discharge.[10]

Candida albicans can endure and thrive in osmolarity, temperature, accessibility of nutrients, and physiological extremes of pH. The multiple virulence characteristics like the discharge of hydrolytic enzymes, dimorphic behavior, phenotypic interchanging, and adhesion factors, are expressed by Candida albicans.[11]

The study concluded that the occurrence of Candidiasis is two times higher in pregnant women who are in third trimester when compares with non-pregnant women.[12] Vulvovaginal candidiasis occurs more frequently in people with diabetes; many investigators have suggested it.[13] After antibiotic treatment, C. albicans was more likely to be linked with vulvovaginal candidiasis than other species.[14] The highest incidence of genitourinary candidiasis within the age group 20 – 30 years have been reported.[15]

A study on 110 pregnant women conducted in Hyderabad, Pakistan, on vaginal candidiasis. The results showed that 27% had vaginal candidiasis during pregnancy, while only 11% are without any symptoms. The pregnant women with diabetic also showed the amplified ratio of said infection. Additionally, no difference was detected concerning the trimester of pregnancy and age.[16]

MATERIAL & METHODS

The study was a descriptive cross-sectional hospital-based study of women that have abnormal vaginal discharge in the visiting unit of obstetrics and gynecology, conducted in the Microbiology section of the Department of Pathology, SZH-RYK. The whole study took four months November 2018 to February 2019 from the date of ethical approval. The minimum sample size was 215.

Women with abnormal vaginal discharge, itching, or genital burning and of reproductive age were considered along with pregnant and non-pregnant ladies. Patients that were currently on their menstrual bleeding. Those who had undergone a hysterectomy. Patients that were catheterized or with cervical malignancies

Data Collection

The collection of data was done by using proforma that contained various patients of variable ages, pregnant women, women with their pregnancy trimester, pruritis, cheesy vaginal discharge, diabetics, and intense usage of antibiotics. Approval was taken from all the contributors and all personal data was kept private. A sterile speculum was used to expose the vagina after swabbing the vulva using sterile water. Specimens were taken from the posterior fornix with the help of sterile cotton swabs that were instantly put into a sterile tube. For further processing and cultivation, the specimens were labeled properly and transferred in sterile containers.

Sample Cultivation and Isolation

In order to identify pseudo hyphae in Candida, Wet microscopy was done by dipping a small amount of discharge from a HVS into saline on a microscopic slide. Gram-staining was performed (Figure-1). Yeast growth showed the characteristic colonial morphology of C. Albicans (white to the cream colony with a smooth border, pasty, and moist appearance, Figure-2 & 3) was noted. Isolation of yeasts was performed on Sabouraud Dextrose Agar (SDA) after incubation at 37 °C for 48 hours.

Identification of C. albicans

For the identification of C. albicans, Germ tube experiment was performed. The frequency of Candida albicans was 64% using the above test while that of non-albicans Candida spp. was 36%.

The data were entered into SPSS version 16. The qualitative data were presented as percentages. Tables and charts were also drawn to present the data.

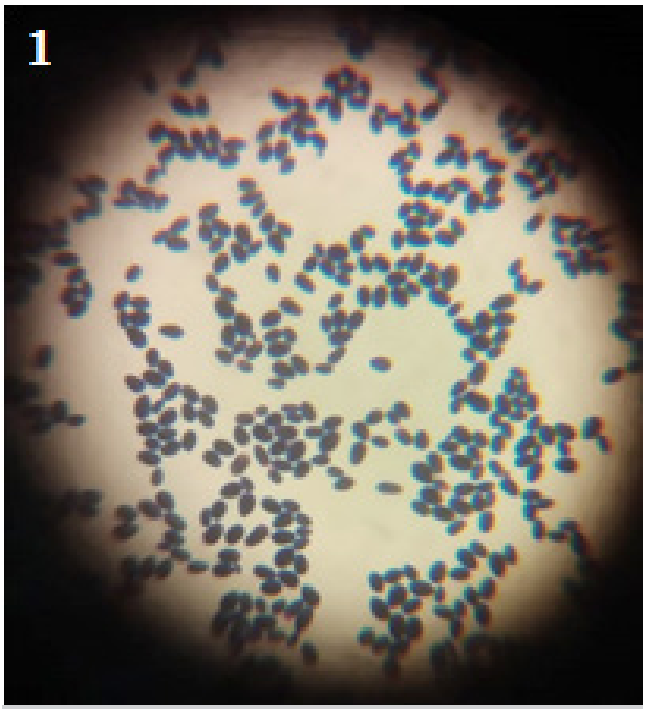

Figure-1. Gram stained smear of Candida,

Figure-2. C.albicans colonies on Sabroud agar,

RESULTS

Table-I shows that the frequency of Candida albicans was highest (65.6%) among age group of 26-30 years followed by age group of 21-25 years (41.2%), 36-40 (34.3%), 31-35 (28.9%), 16-20 (23.5%), 41-45 (16.7%) and 46-50 (.0%).(P= 0.02%).

Table-II shows that the frequency of Candida albicans was highest among pregnant women 43.2%, while 36.0% in non-pregnant women. (P= 0.001).

Table-III shows that the frequency of Candida albicans was highest in the third trimester of pregnancy 55.6%, followed by 45.5% in the second trimester of pregnancy and 12.5% in the third trimester of pregnancy. (P= 0.007).

Table-IV shows that the frequency of Candida albicans was highest in women with pruritis 77.9% while 14.5% in women without pruritis. (P= 0.000).

Table-V shows that the frequency of Candida albicans was highest in women with cheesy vaginal discharge 73.9% while 11.8% in women without cheesy vaginal discharge. (P= 0.000).

Table-VI shows that the frequency of Candida albicans was highest among diabetic patients 52.0%, while 35.3% among non-diabetic patients. (P= 0.3).

Table-VII shows that the frequency of Candida albicans was highest among antibiotics users 45.0% while 30.0% in non-antibiotics users. (P= 0.07).

Figure-3 shows that overall 80(37.2%) out of 215 were Candida albicans, 45(20.9%) were non-albicans Candida species, 20(9.3%) were other than Candida species and 70(32.5%) were having no growth.

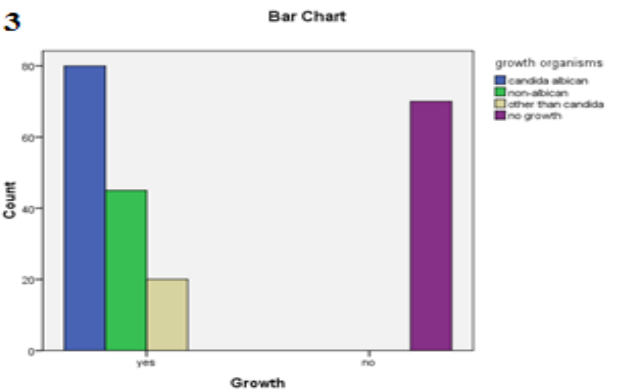

Figure-3. Percentage of growth organisms

	16-20 (years)	21-25 (years)	26-30 (years)	31-35 (years)	36-40 (years)	41-45 (years)	46-50 (years)	Total
Candida albicans	4(23.5%)	28(41.2%)	21(65.6%)	13(28.9%)	12(34.3%)	2(16.7%)	0(.0%)	80(37.2%)
Non-albicans Candida spp.	5(29.4%)	16(23.5%)	5(15.6%)	12(26.7%)	3(8.6%)	2(16.7%)	2(33.3%)	45(20.9%)
Other than Candida	2(11.8%)	5(7.4%)	1(3.1%)	7(15.6%)	4(11.4%)	1(8.3%)	0(.0%)	20(9.3%)
No growth	6(35.3%)	19(27.9%)	5(15.6%)	13(28.9%)	16(45.7%)	7(58.3%)	4(66.7%)	70(32.5%)
Total	17(7.9%)	68(31.6%)	32(14.9%)	45(20.9%)	35(16.3%)	12(5.6%)	6(2.8%)	215(100%)

Table-I. Frequency of candida albicans and other isolates in various age groups (n=215)

	Pregnant	Not Pregnant	Total
Candia albicans	16 (43.2%)	64 (36.0%)	80 (37.2%)
Non-albicans Candida spp.	15 (40.5%)	30 (16.8%)	45 (20.9%)
Other than Candida	3 (8.1%)	17 (9.6%)	20 (9.3%)
No growth	3 (8.1%)	67 (37.6%)	70 (32.6%)
Total	37 (17.2%)	178 (82.8%)	215 (100%)

Table-II. Frequency of Candida albicans and other isolates about pregnancy (n=215)

	1st Trimester	2nd Trimester	3rd Trimester	Total
Candida albicans	1 (12.5%)	5 (45.5%)	10 (55.6%)	16 (43.2%)
Non-albicans candida spp	5 (62.5%)	4 (36.4%)	6 (33.3%)	15 (40.6%)
Other than candida	1 (12.5%)	1 (9.1%)	1 (5.6%)	3 (8.1%)
No growth	1 (12.5%)	1 (9.1%)	1 (5.6%)	3 (8.1%)
Total	8 (21.6%)	11 (29.7%)	18 (48.7%)	37 (100.0%)

Table-III. Frequency of Candida albicans and other isolates about terms of pregnancy (n=37)

	With Pruritis	Without Pruritis	Total
Candida albicans	60 (77.9%)	20 (14.5%)	80 (37.2%)
Non-albicans Candida spp.	15 (19.5%)	30 (21.7%)	45 (20.9%)
Other than Candida	1 (1.3%)	19 (13.8%)	20 (9.3%)
No growth	1 (1.3%)	69 (50.0%)	70 (32.6%)
Total	77 (35.8%)	138 (64.2)	215 (100.0%)

Table-IV. Frequency of Candida albicans and other isolates aboutpruritis (n=215)

	With Cheesy Discharge	Without Cheesy Discharge	Total
Candida albicans	65 (73.9%)	15 (11.8%)	80 (37.2%)
Non-albicans Candida spp.	13 (14.8%)	32 (25.2%)	45 (20.9%)
Other than Candida	3 (3.4%)	17 (13.4%)	20 (9.3%)
No growth	7 (8.0%)	63 (49.6%)	70 (32.6%)
Total	88 (40.9%)	127 (59.1%)	215 (100.0%)

Table-V. Frequency of Candida albicans and other isolates about cheesy vaginal discharge(n=215)

	With Diabetes	Without Diabetes	Total
Candida albicans	13 (52.0%)	67 (35.3%)	80 (37.2%)
Non-albicans Candida spp.	4 (16.0%)	41 (21.6%)	45 (20.9%)
Other than candida	1 (4.0%)	19 (10.0%)	20 (9.3%)
No growth	7 (28.0%)	63 (33.2%)	70 (32.6%)
Total	25 (11.6%)	190 (88.4%)	215 (100.0%)

Table-VI. Frequency of Candida albicans and other isolates about diabetes (n=215)

	With Intense Antibiotic Use	Without Intense Antibiotic Use	Total
Candida albicans	45 (45.0%)	35 (30.4%)	80 (37.2%)
Non-albicans Candida spp.	22 (22.0%)	23 (20.0%)	45 (20.9%)
Other than Candida	8 (8.0%)	12 (10.4%)	20 (9.3%)
No growth	25 (25.0%)	45 (39.1%)	70 (32.6%)
Total	100 (46.5%)	115 (53.5%)	215 (100.0%)

Table-VII. Frequency of Candida albicans and other isolates in patients with intense antibiotic use (n=215)

DISCUSSION

This research shows the frequency of Candida albicans among different women that are in the Gynaecology and Obstetrics unit of Sheikh Zayed Hospital, a tertiary care hospital, Rahim Yar Khan. The prevalence rate of 64.0% observed in this research was 70.0% similar to findings that were stated by Nwankwo EOK et al.[17] and in Kano, Nigeria in females of reproductive age Moreover, the higher incidence of candidiasis among the age group of 26-30 years shown in table no 1, this disparity was statistically significant (P = 0.02). Higher incidence among these groups could be due to the increased levels of estrogen in this group of women, which results in a favorable pH for Candida colonization. The higher incidence among this age group was also found in another study by Isibor et al.[18]

The results of the current study explained that Candida is related to pregnancy. C. albicans is generally isolated from pregnant women when it compares to non-pregnant women with a statistically significant level at p = 0.001. Higher incidence among pregnant women was also present in another study.[19] Glycogen provides a considerable good source of carbon for Candida. The researchers usually suggested that a high percentage of glycogen available in vaginal tissues due to significant changes in hormones during pregnancy. The highest percentage of 52.7% was also found within the third trimester in another study conducted in North West Nigeria.[20] This can be ascribed to a higher level of corticosteroids, progesterone, and estrogens during the advanced stage of pregnancy which reduces the vaginal defense mechanisms and boost the yeast cells' growth rate.

The presence of pruritus was found to be 77.9%. This difference was statistically highly significant (P= 0.000). 80% of pruritus was found in another study conducted in India.[21] The presence of cheesy vaginal discharge was found to be 73.9%, with a statistically significantly different at p = 0.000. These results are inconsistent with previous studies as well.[22] The women having vulvovaginal candidiasis usually exhibit a stronger burning sensation of vulval epithelium due to multiple reasons such as vulvar skin infection or metabolites of yeast.[22]

The studies indicated that fungal vaginitis is present amongst diabetic women as compared to non-diabetic women. This study shows that Candida albicans among diabetic women were 52.0% and among non-diabetic was 35.3% having a non-significant relationship at p> 0.05. The frequency of Candida albicans among diabetic women was also high in another study.[23] The glucose not only arouses yeast development but also stimulate change to a more virulent stage. Diabetes increases the adherence of C. Albicans to vaginal epithelial cells in vitro.

The patients who used antibiotic medicines regularly are more susceptible to develop symptomatic vulvovaginal candidiasis. In the present study prevalence of Candida albicans, 45.0% among antibiotic users was more as compared to the non-antibiotic user, 30.0% having a non-significant relationship at p > 0.05. The prevalence of Candida albicans 44.8% among antibiotic users was also high in another study conducted in India. Antibiotics suppress normal bacterial colonization and permit the colonization by yeasts. The utilization of antibiotics may also intensify the symptoms by halting the defensive vaginal flora.[18]

CONCLUSION

This study concluded that prevalence of Candida

albicans among pregnant women is more than non-pregnant women especially in 3rd trimester of pregnancy and pruritus as a key symptom of VVC is observed. The infection of Candida albicans among diabetic women is more than non-diabetic women and prevalence among antibiotic users is more than non-antibiotic users. The adequate investigations and early treatment of vaginal infections will reduce the disease burden and avoid complications associated with it.

REFERENCES

1. Pervaiz S, Sarwar F, Rauf A, Saifullah M. **High Vaginal Swabs; Frequency and antimicrobial susceptibility of gram negative rods isolated from high vaginal swabs.** Professional Med J 2017; 24(4):622-626.

2. Puri R, Malhotra J. **Recurrent urinary tract infection (UTI) in women.** South Asian Federation of Obstetrics and Gynecology. 2009 Jan-Apr; 1(1):10-3.

3. Abdelaziz, Z.A.; Ibrahim, M.E.; Bilal, N.E. and Hamid, M.E. **Vaginal infections among pregnant women at Omdurman Maternity Hospital in Khartoum, Sudan,** J Infect Dev Ctries, 2014; 8(4): 490-497.

4. Islam A, Safdar A, Malik A. **Bacterial vaginosis.** J Pak Med Assoc. 2009; 59(9):601-4 2.

5. Lehman R. **Clinical approach to recognizing and managing a patient with vaginal atrophy: A guide for physician assistants.** Internet Journal of Academic Physician Assistants. 2009; 8(1).

6. Busetti m, d'agaro p, campello c. **Journal of clinical pathology 2017;** 60:1140-1143.

7. Warren levinson. **Review of medical microbiology and immunology.** 2018; 414-417.

8. Pethani JD, Gusani J, Rathod S, Shah PD. **Candida species identification of clinical specimens and its changing pattern in a tertiary care hospital.** Indian J Appl Basic Med Sci. 2012; 14: 83 - 91.

9. Imran, Z.K. and Al-Shukry, H.N. **Molecular diagnosis of vaginal candidiasis by polymerase chain reaction (PCR) and random amplification polymorphism DNA (RAPD-PCR) in Babylon Province,** Iraq, Afr. J. Microbiol. Res., 2014; 8(6): 496-502.

10. Zhou, X.; Westman, R.; Hickey, R.; Hansmann, M.; Kennedy, C.; Osborn, T. and Forney, L. **Vaginal Microbiota of Women with Frequent Vulvovaginal Candidiasis, Infect.** Immun. J., 2009; 77 (9): 4130–4135.

11. Tavanti A, Campa D, Bertozzi A, Pardini G, Naglik JR, Barale R, Senesi S. **Candida albicans isolates with different genomic backgrounds display a differential response to macrophage infection.** Microbes Infect 2006; 8:791-800.

12. Fernándezlimia o1, lantero mi, betancourt a, de armas e, villoch a. **Medgenmed** 2004; 6: 50.

13. de Leon, E. M., Jacober, S. J., Sobel, J. D., and Foxman, B. **Prevalence and risk factors for vaginal Candida colonization in women with type 1 and type 2 diabetes.** 2002; BMC Infectious Diseases 2. Retrieved from http://www.biomedcentral.com/1471-2334/2/1.

14. Pirotta, M. V., and Garland, S. M. **Genital Candida species detected in samples in samples from women in Melbourne, Australia, before and after treatment with antibiotics.** Journal of Clinical Microbiology 2006; 44 (9): 3213 – 3217.

15. Okungbowa, F. I., Dede, A. P., Isikhuemhen, O. S., and Okungbowa, M. O. **Age and marital distributions of genitourinary candidiasis among symptomatic women in Nigeria.** Medical Journal of Islamic World Academy of Sciences 16 2006; (2): 67-69.

16. Parveen n1, muniraa, din i, majeed r. **J coll physicians surgpak** 2008; 18: 154-157.

17. Nwankwo EOK, Kandakai-Olukemi YT, Shuaibu SA. **Aetiologic agents of abnormal vaginal discharge among females of reproductive age in kano, Nigeria.** Journal of Medicine and Biomedical Sciences. 2010, 12-16.

18. Isibor, J. O., Samuel, S. O., Nwaham. **Prevalence of bacterial and Candida albicans infection amongst women attending Irrua Specialist Teaching Hospital, Irrua,** Nigeria African Journal of Microbiology Research 2011; Vol. 5(20), pp. 3126-3130.

19. A. Ahmad, A.U. Khan. **Prevalence of Candida species and potential risk factors for vulvovaginal candidiasis in Aligarh, India.** European Journal of Obstetrics & Gynecology and Reproductive Biology 2009; 144 : 68–71.

20. Nnadi and Singh: **Genital Candida species, pregnancy.** Sahel Medical Journal 2017; Vol 20(01).

21. Samal R et al. Int J Reprod Contracept Obstet Gynecol. 2015; 4(4):1142-47.

22. Tarry W, Fisher M, Shen S, Mawhinney M. **Candida albicans: The estrogen target for vaginal colonization.** J Surg Res 2005; 129:278–82.

23. O. Grigoriou et al. /**Prevalence of clinical vaginal candidiasis in a university hospital and possible risk factors** / **European Journal of Obstetrics & Gynecology and Reproductive Biology** 126 (2006) 121–125.

AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	M. Shahbaz Hussain	Principal Author, Conceived the idea and Designed the study.	
2	Umar Khalid Cheema	Literature Review, Interpretation and Finalization.	
3	Aamir Ashaq	Proof reading, Statistical analysis.	
4	Muhammad Sajjad	Laboratory Data Collection.	
5	Maryam Habib	Experimental work, Writing Article.	
6	Mehwish Anwar	Review, Interpretation.