

Original Research Article

A prevalence study of vaginal candidiasis among pregnant women

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ABSTRACT

Background: Pregnancy is associated with specific anatomical, physiological and immunological changes that can predispose to infection and also alter the response to the disease process. Infections in pregnancy demands prompt adequate and careful management. The disease process as well as the treatment protocol may have profound effects on the outcome of pregnancy. Pregnant women frequently develop vaginal discharge which can lead to complications during pregnancy like abortions, premature birth, low birth weight and other morbidities. Some of the infections may be serious and life threatening for the mother while others may seriously jeopardize the fetus or neonate leaving the mother asymptomatic. The aim and objective of this study was based on the present study was aimed to study the prevalence of vaginal candidiasis among pregnant patients who were visited in outdoor patient's department of Prasutitantra and Streeroga.

Methods: About 135 high vaginal swabs were collected from the women who carrying 2nd and 3rd trimester of pregnancy with symptoms of vaginal infection. These samples were tested under microscopic examination and culture on Mac Conkey agar, blood agar and Sabouraud dextrose agar respectively. Colonial morphology, wet/K.O.H. preparation, gram staining, germ tube test, were carried out for identification of the isolated organisms.

Results: Out of 135 samples collected, 61 (45.18%) patients were shown positive fungal infection of candidial species. The age group showing the highest number of positive candidiasis was of 20 to 25 years. Multigravida (60%) were more commonly affected than primigravida (40%) and commonly seen in third trimester (67.41%).

Conclusions: Vaginal Candidiasis was common in pregnant women with more common in young adults.

Keywords: Pregnant women, Vaginal candidiasis

INTRODUCTION

The pregnant women are more prone to vaginal infection that great challenges for obstetrician today. Vaginal discharge may be physiological or pathological. Approximately 75% of all pregnant women experience at

least one episode of vaginal infection and 50% of them suffer recurrent events. The female genital tract provides a satisfactory environment for many pathogenic microorganisms and multiple infections are there for common.

Vaginal candidiasis is infection caused by extra growth of candida species affecting the genital tract as adaptable pathogen. Vaginal candidiasis is a common type of vaginitis, a gynecological disorder manifests with an odorless curdy white discharge (“cottage cheese”) in the female lower reproductive tracts with pruritus, irritation, dysuria or dyspareunia.^{1,2}

Candida species are part of the lower genital tract flora in 20-50 % of healthy asymptomatic women. Carrier rates are higher in women treated with broad spectrum antibiotics, pregnant women, diabetic women and women with HIV/AIDS.³ The present study was aimed to study the prevalence of vaginal candidiasis among pregnant patients. The aim and objective of this study was based on the present study was aimed to study the prevalence of vaginal candidiasis among pregnant patients in west region of Gujarat who were visited in outdoor patient’s department of Prasutitantra and Streeroga.

METHODS

A cross sectional survey study was performed for the survey study, Patients were selected from the OPD of Prasutitantra and Streeroga, Institute for post graduate teaching and research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat, India. Patients fulfilling the criteria for selection were integrated into the study irrespective of caste, religion etc.

Inclusion criteria

- Age 20 to 40 years with different parity,
- 2nd and 3rd trimester of pregnancy,
- White discharge present during examination,
- Inflammation present in vulva and/or vagina,
- Micro-organisms present in vaginal discharge.

Exclusion criteria

- 1st trimester of pregnancy,

- Age below 20 years or above 40 years with non-specific vulvovaginitis,
- Women with severe physical illness, any organic pathology, hepatic, cardiac, renal disease and any acute infection of any system.

Prevalence was assessed based on

- Self-reported symptoms such as white discharge, itching etc. suggestive of vulvovaginitis,
- Through proper history and examination,
- Confirmed by per speculum examination,
- Investigation such as wet vaginal smear and vaginal swab culture.

Study period was performed from February 2017 to February 2018 for 1 year.

Two swabs were collected from each of the patients at the same time and transported immediately to in house microbiology laboratory of IPGT and RA.

- The first swab was used for the preparation of wet mount film. To rule out *trichomonas vaginalis*, vaginal candidiasis, pus cells and epithelial cells,
- Vaginal swab was obtained, spread on a grease free glass slide, allow it to air dry and send it to microbiology laboratory for staining process,
- The second vaginal swab was sent for culture process. Swab was cultured on differential and selective medium i.e. Mac Conkey agar (MA), blood agar (BA) and Sabouraud dextrose Agar (SDA) respectively.
- The inoculated culture media were incubated at 37°C for 24-48 hours for bacterial findings and up to 5-7 days for fungal finding with special provided atmosphere.
- The isolated organisms were diagnosed by colonial morphology, cultural characteristics and biochemical test by using API (analytical profile index) system. (Figure 1: A, B and C).

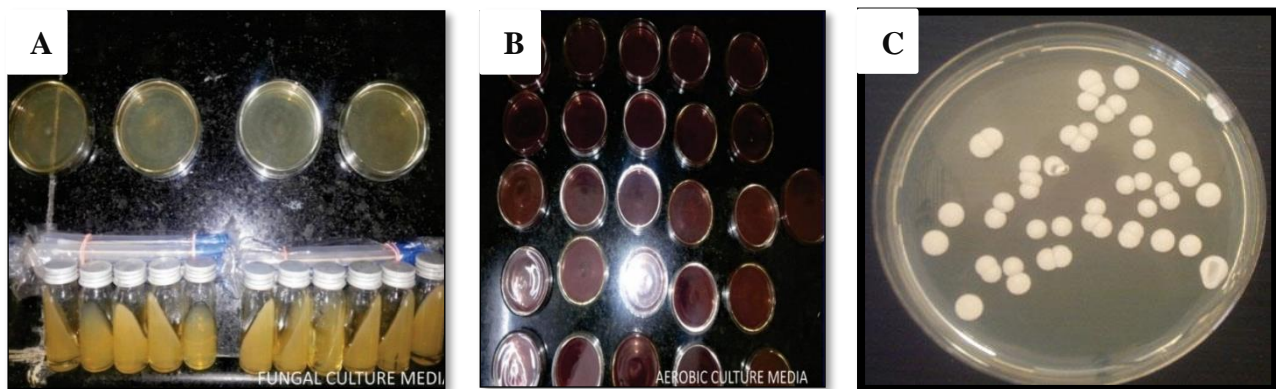


Figure 1: (A) Fungal culture media (i.e. SDA), (B) Bacterial culture media (i.e. MA), (C) White cheesy mucoïd growth on SDA.

Aerobic and fungal culture procedure and related media preparation and plates for present study done in microbiology laboratory- IPGT and RA, GAU, Jamnagar, Gujarat, India.

An informed written consent was taken from each of the participants and the ethical committee approval was also taken before starting the study.

RESULTS

About 135 high vaginal swabs were collected to identify the vaginal candidiasis from clinically suspected pregnant women.

The patients were having complaints like white, cheesy and/or curdy vaginal discharge, itching, swelling, redness, smell. Complaint of vaginal discharge was present in all i.e. 100% patients, complaint of itching was present in 51.11% patients and complaint of odor, pain and burning was present in 25.93%, 22.22% and 20.74% respectively (Table 1).

Table 1: Vaginal complaints of pregnant women.

Complaints	No. of pregnant women	Percentage
Yoni Srava (discharge)	135	100
Yoni Kandu (itching)	69	51.11
Yoni Daurgandhya (odor)	35	25.93
Yoni Vedana (pain)	30	22.22
Yoni Daha (burning)	28	20.74

Here, it may be predicted that due to Kapha dominance in their (during pregnancy according to Ghanekara) body, and the excessive intake of Kaphakara Ahara and Vihara, Kapha is more prone to vitiate and it may produce the disease. Involvement of Kapha Dosha in Samprapti, gives the cardinal symptoms like Yoni Srava and Yoni Kandu. Excessive discharge causes irritation in vagina, which causes itching; Yoni Daha and Yoni Daurgandhya were seen in most of patients. It may be due to vitiated Vata causing Ashayapakarsha of Pitta.⁴ Excoriation of vagina is the possible cause of Yoni Daha due to itching and Yoni Vedana is due to active involvement of Vata Dosha. In modern view, during pregnancy physiologically lowered immunity leads to growth of microorganisms in excess and causes infection of lower genital tract producing excessive discharge, itching, foul smelling and burning sensation in urine etc.

The age group of 20 to 25 years showing the highest number of positive candidiasis; was clinical confirmation confirmed by different laboratory diagnostic modalities (Figure 2). This indicates that this disease is a common problem of active reproductive life.

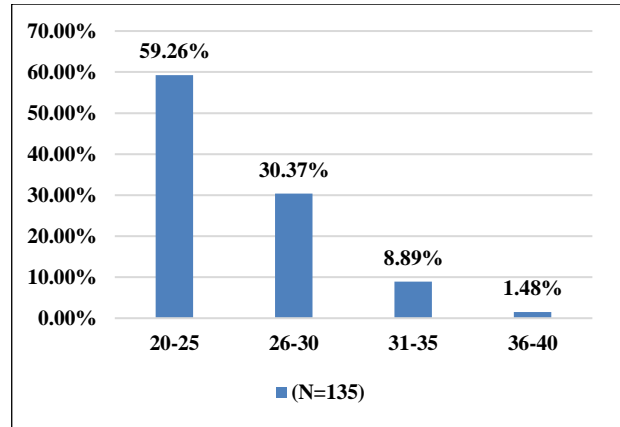


Figure 2: Age group (years) wise distribution of the pregnant women.

Majority of the women i.e. 81 (60%) were multi-gravida while 54 (40%) were primigravida (Table 2).

Table 2: (Original) gravidity wise distribution of the pregnant women.

Gravidity	No. of pregnant women	Percentage
Primigravida	54	40
Multigravida	81	60
Total	135	100

In present study maximum numbers of patients i.e. 67.41% were of third trimester while of 32.59% patients were of second trimester (Figure 3).

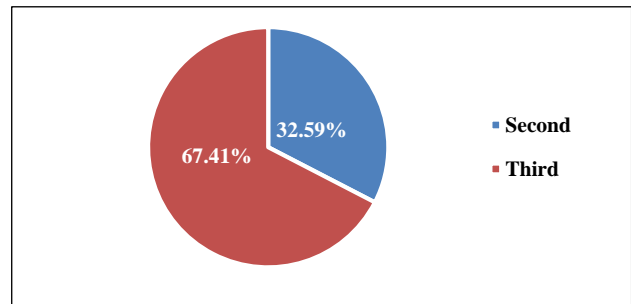


Figure 3: Trimester wise distribution of the pregnant women.

According to Acharya Charaka, 7th months onwards Garbhini becomes emaciated, suffers from loss of strength and feels excessively exhausted.⁵ It is due to lack of nourishment of maternal Dhatus as the Rasa is driven to nourish more and more the flesh and blood of foetus. This physiological status, with the progress of pregnancy makes her prone to disease. During second trimester, decreased immunity causes decreased local defense mechanism which is also responsible for growth of microorganism.

Out of these, 61 (50.37%) patients were exposed with positive candidial infection by different laboratory diagnostic modalities (Figure 4).

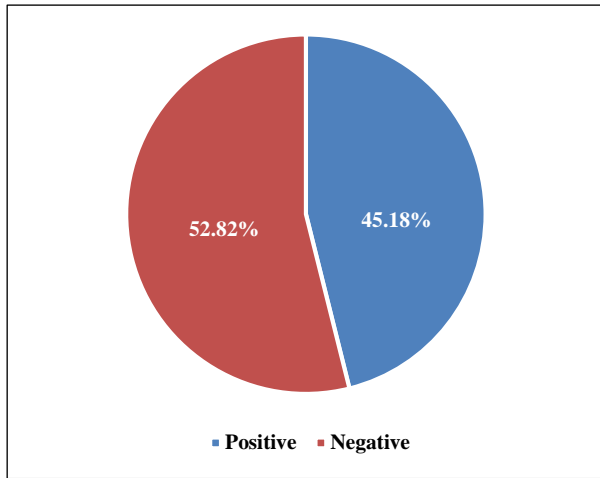


Figure 4: (Original) Number of pregnant women with positive vaginal candidiasis.

During pregnancy due to increased glycogen level and increased secretion; that promote the development/growth of fungal infection especially yeast cells. Among 61 candidial infections, *candida glabrata* infection was found 09.63% while *candida albicans* infection was found 35.55% of patients (Table 3).

Table 3: (Original) frequency, distribution and identification of candida isolates.

Candida isolates	No. of germ tube test positive	No. of germ tube test negative	Percentage of fungal isolates
<i>Candida albicans</i>	48	00	35.55
<i>Candida glabrata</i>	00	13	09.63
Total	48	13	45.18

DISCUSSION

Vaginal discharge is a common health problem among women in the reproductive age. Whether asymptomatic or symptomatic, it is usually neglected by women making the diagnosis more difficult. The female genital tract provides a satisfactory environment for many pathogenic microorganisms and multiple infections are therefore common. It is colonized by variety of species of commensals causing no harm except under abnormal conditions. The incidence of pathogens in vaginal discharge varies in different regions of the world.⁶

All the precise data difficult to obtain, the prevalence of genital infection can lead to considerable morbidity and mortality among neonates and their mothers.⁷ Candida is

normally present as acommensals in 25-50% of healthy female. It is not a sexually transmitted organisms, but it is commonly associated with STDs. *Candidial vaginal* discharge was burning, itching, erythema, thick-curdy adherent discharge, odorless or with odour.⁸

Vaginal candidiasis in pregnant women is usually ignored in our country. It is a common and frequently distressing infection in women of child bearing age; approximately 75% of all women experience at least one episode of Candidial infections during their lifetime.⁹

Factors that predispose women to Vaginal Candidiasis include hormonal variation, i.e., during pregnancy, luteal phase of menstrual cycle, abuse of antibiotic and use of oral contraceptives. This study showed *candida albicans* as the most common *vaginal candida* species followed by *Candida glabrata* causing *vaginal candidiasis* among pregnant women. Nelson M et al, also reported same.¹⁰

The pathogenesis and prognosis of candidial infections are affected by the host immune status and also differ greatly according to disease presentations. Therefore, diagnosis, management, and treatment choices vary and need to be considered in the overall setting of the affected human host.

Lactobacillus proliferates and cause enzymatic breakdown of cellular glycogen, resulting in lactic acid and H₂O₂, which lowers the pH up to 3.5-4.5. This indicates normal vaginal environment which inhibits growth of pathogenic organisms.¹¹ During pregnancy due to increased glycogen level and increased secretion; that promote the development/growth of fungal infection especially yeast cells. Several additional factors like gestational diabetes, frequent antibiotic therapy, HIV status (Immuno-compromised status), contraceptives, and reproductive hormones also predispose women to acute and chronic candidiasis.¹²

This immune inequity is caused by a number of factors, such as excess stress, allergies, indiscriminate use of antibiotics, steroids, birth control pills and hormonal drugs and nutrient deficiency. Diabetes mellitus, pregnancy, and the use of tight nylon underwear also enhance overgrowth of candida in a manner that cannot easily be controlled by the body's defense mechanisms.^{13,14}

Proper education regarding sexual activity to teenagers, adolescents and young adults could be useful in the control of *vaginal candidiasis*. However, it near absence in the very young age groups and its high incidence in the greatest sexually active age range further strengthens the belief that sexual activity could contribute to a large extent, the spread of the disease. The especially high prevalence of *vaginal candidiasis* among commercial sex workers further affirms the impact of unsafe sexual activity on the burden of the disease.^{15,16}

CONCLUSION

Vaginal candidiasis was common in pregnant women with more common in young adults of age group ranging from 20 to 25 years, an early reproductive age.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Altayyar IA, Alsanosi AS, Osman NA. Prevalence of vaginal candidiasis among pregnant women attending different gynecological clinic at South Libya. *European J Exp Bio.* 2016;6(3):25-9.
2. Nwadioha SI, Egah DZ, Alao OO, Iheanacho E. Risk factors for vaginal candidiasis among women attending primary health care centers in Jos, Nigeria. *J Clinic Med Res.* 2010;2(7):111-3.
3. Singh SI. Treatment of Vaginal candidiasis. *Clin Rev CPJ/RPC.* 2003;136(9):26-30.
4. Satyanarayana S. Charaka Samhita Chaukhambhabharati academy; Varanasi, Cha Su. 2013;17:45-46.
5. Satyanarayana S. Charaka Samhita Chaukhambhabharati academy; Varanasi, Cha Sha. 2013;4:21-23.
6. Swetha V, Gopalan K, Asha D, Kavitha A. Epidemiology and clinico-investigative study of organisms causing vaginal discharge, India. *Indian journal of sexual transmitted disease and AIDS.* 2017;38(1):69-75.
7. Sharief M. Genital tract infection among woman using various contraceptive method in Basrha, Iraq. *J. Eastern Mediterranean Heal.* 1998;4(3):487-92.
8. Everett VJ. Vaginal discharge. *Med Dig.* 1980;6(8):17-24.
9. Omar AA. Gram stain versus culture in the diagnosis of vaginal candidiasis. *East Mediter. Health J.* 2001;7(6):925-34.
10. Nelson M, Wanjiru W, Margaret MW. Prevalence of vaginal candidiasis and determination of the occurrence of Candida species in pregnant women attending the antenatal clinic of Thika District Hospital, Kenya. *Open J Med Microbio.* 2013;3(4):264.
11. Khamees S. Characterization of vaginal discharge among women complaining of genital tract infection. *Int J Pharm Life Sci.* 2012;3(10).
12. Paul S, Kannan I. Prevalence of antenatal Vaginal candidiasis: our experience. *Int J Reprod Contracep Obstetr Gynecol.* 2017;6(2):443-6.
13. Al-Aali KY. Prevalence of vaginal candidiasis among pregnant women attending Al-Hada military hospital, western region, Taif, Saudi Arabia. *Int J Sci Res.* 2015;4(5):1736-43.
14. Oyewole OA, Okoliegbe IN, Alkhalil S, Isah P. Prevalence of vaginal candidiasis among pregnant women attending Federal University of Technology, Minna, Nigeria, Bosso Clinic. *Res J Pharm Biol Chem Sci.* 2013;4:113-20.
15. Jombo GT, Opajobi SO, Egah DZ, Banwat EB, Akaa PD. Symptomatic Vaginal candidiasis and genital colonization by Candida species in Nigeria. *J Public Health Epidemiol.* 2010;2(6):147-51.
16. Khairnar R, Khairnar A. Vaginal candidiasis among pregnant women a prevalence study. *Sch J App Med Sci.* 2017;5(2a):336-8.

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