

A Clinical Study on the Incidence and Management of Cases of Vaginal Candidiasis in Patients Coming for ANC Visit at Tertiary Care Hospital Over a Period of One Year

Nalini I. Anand¹, Trupti Nayak², Mona Gandhi², Jignyasa Patel³

¹Professor and Head, Department of Obstetrics & Gynaecology, Shri M.P. Shah Govt. Medical College, Jamnagar

²Head of Unit, Department of Obstetrics & Gynaecology, Shri M.P. Shah Govt. Medical College, Jamnagar

³2nd Year Resident, Department of Obstetrics & Gynaecology, Shri M.P. Shah Govt. Medical College, Jamnagar

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Corresponding Author: Dr. Jignyasa Patel

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Abstract:

Background: Vaginal candidiasis, or yeast infection, is a common condition caused by the overgrowth of *Candida* species, with pregnancy significantly increasing susceptibility due to hormonal and immunological changes. Around 75% of pregnant women experience at least one episode, with 50% facing recurrent infections. These physiological shifts, along with altered vaginal pH and immune modulation, create a favourable environment for *Candida* colonization, impacting maternal and fetal health. This study aims to investigate the prevalence, risk factors, and management of vaginal candidiasis among pregnant women in western Gujarat, providing insights across all trimesters and evaluating current treatment strategies.

Material and Methods: This cross-sectional survey study was conducted from June 2023 to May 2024 at M.P. Shah Government Medical College and GG Government Hospital, Jamnagar, targeting pregnant women attending the Obstetrics and Gynecology OPD. Among 8,412 patients, 1,642 (19.5%) were suspected of vaginal candidiasis, with 1,120 (68.2%) confirmed positive through clinical examinations. The study included pregnant women aged 18 to 49 across all trimesters and excluded those with severe physical ailments or recent medication use. Data analysis was performed using SPSS version 23, employing descriptive statistics, chi-square tests, odds ratios, and 95% confidence intervals to evaluate the association of risk factors, with significance set at $p < 0.05$.

Results: The mean age of participants was 24.2 ± 4.3 years, with a mode and median of 25 years. Out of 8,412 patients, 1,642 were suspected of vaginal candidiasis, and 1,120 (68.2%) were confirmed positive. Most positive cases occurred during the 2nd trimester (54.82%). Primigravida women constituted 59.64% of positive cases. Symptomatic cases were higher among positives (75%), with diabetes present in 6.25% and prior antibiotic use in 16.07%. All positive cases received vaginal hygiene management, with 98% treated using vaginal suppositories and 2% with antifungal creams.

Conclusion: Our study highlights a high prevalence of vaginal candidiasis among pregnant women, with the majority of cases occurring in the second trimester and among primigravida women. Effective management with vaginal hygiene and suppositories demonstrates promising outcomes, emphasizing the need for early detection and targeted interventions during pregnancy.

Keywords: Vaginal candidiasis, Pregnancy, Prevalence, Antifungal management.

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Introduction

Vaginal candidiasis, commonly referred to as a yeast infection, is a prevalent condition characterized by the overgrowth of *Candida* species in the vaginal area. [1] During pregnancy, women are particularly susceptible to this infection due to significant hormonal and immunological changes that disrupt the vaginal microbiota, creating a favourable environment for *Candida* overgrowth.

[2] Approximately 75% of all pregnant women experience at least one episode of vaginal infection, and 50% of these women suffer from recurrent events. [3] The female genital tract provides an ideal environment for many pathogenic microorganisms, making multiple infections common. Understanding the incidence and management of vaginal candidiasis in pregnancy is

crucial for obstetricians today, given the potential implications for maternal and fetal health. [4] Pregnancy is a dynamic state requiring a continuous supply of essential nutrients such as glucose, fatty acids, amino acids, minerals, and vitamins to support normal fetal development despite intermittent maternal food intake. [5] The increased estrogen levels during pregnancy lead to higher glycogen production in the vagina, promoting the proliferation of yeast cells. [6] These physiological changes, along with immune modulation and altered vaginal pH, increase the risk of *Candida* colonization and infection. [7] Vaginal candidiasis manifests with symptoms such as odorless curdy white discharge, pruritus, irritation, dysuria, and dyspareunia. *Candida* species are part of the normal flora of the female genital tract in 20-50% of healthy asymptomatic women, with higher carrier rates among those treated with broad-spectrum antibiotics, pregnant women, diabetic women, and women with HIV/AIDS. [8]

The present study aims to investigate the prevalence, risk factors, and management of vaginal candidiasis among pregnant women in the western region of Gujarat. By analysing clinical examination-based data, this study seeks to provide comprehensive insights into the incidence rates of vaginal candidiasis across all trimesters of pregnancy and evaluate the effectiveness of current management strategies.

Material and Methods

A cross-sectional survey study was undertaken from June 2023 to May 2024 at M.P. Shah Government Medical College and GG Government Hospital in Jamnagar, Gujarat, India. The study targeted pregnant women attending the Obstetrics and Gynecology Outpatient Department (OPD) of the aforementioned institutions. Among 8,412 patients, 1,642 (19.5%) were suspected of having

vaginal candidiasis based on clinical symptoms. Out of these, 1,120 patients (68.2%) were confirmed positive, and clinical examinations were performed by specialists. The study population met specific inclusion criteria, including women aged 18 to 49 years of all trimesters of pregnancy, exhibiting white discharge and signs of inflammation in the vulva and/or vagina and those with severe physical ailments or recent usage of certain medications and indoor patients were excluded from the study. Prevalence of vaginal candidiasis was evaluated through a multifaceted approach, encompassing self-reported symptoms, medical history and physical examinations.

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software version 23. Demographic, clinical, and risk factor data collected from the study participants were entered into the SPSS database for analysis. Descriptive statistics such as frequencies, percentages, means, and standard deviations were calculated to summarize the characteristics of the study population. The distribution of *Candida* species among different groups was assessed using the chi-square test. Furthermore, odds ratios (OR) and 95% confidence intervals (CI) were computed to evaluate the association between various risk factors and Vaginal candidiasis (VC). Statistical significance was set at a p-value of less than 0.05.

Results

The mean age of the participants was 24.2 years, with a standard deviation of 4.3 years. The most frequently occurring age (mode) and the median age both were 25 years. The age range of the participants spanned from a minimum of 18 years to a maximum of 49 years. a total of 8,412 patients attending antenatal care (ANC) visits were evaluated over a one-year period, out of the 1642 suspected cases, 1120 were confirmed positive for *Candida* infection.

Table 1: Age distribution of pregnant women

Age Group (yrs)	Total Suspected Cases (n, %)	Positive Cases (n, %)
<20	288 (17.54%)	194 (17.32%)
21-25	655 (39.89%)	452 (40.36%)
26-30	480 (29.23%)	366 (32.68%)
>30	219 (13.34%)	108 (9.64%)
Total	1,642 (100%)	1120 (100%)

In our study, out of the 1,642 suspected cases, 978 (59.56%) were primigravida and 664 (40.44%) were multigravida. Among the 1,120 positive cases, 668 (59.64%) were primigravida and 452 (40.36%) were multigravida.

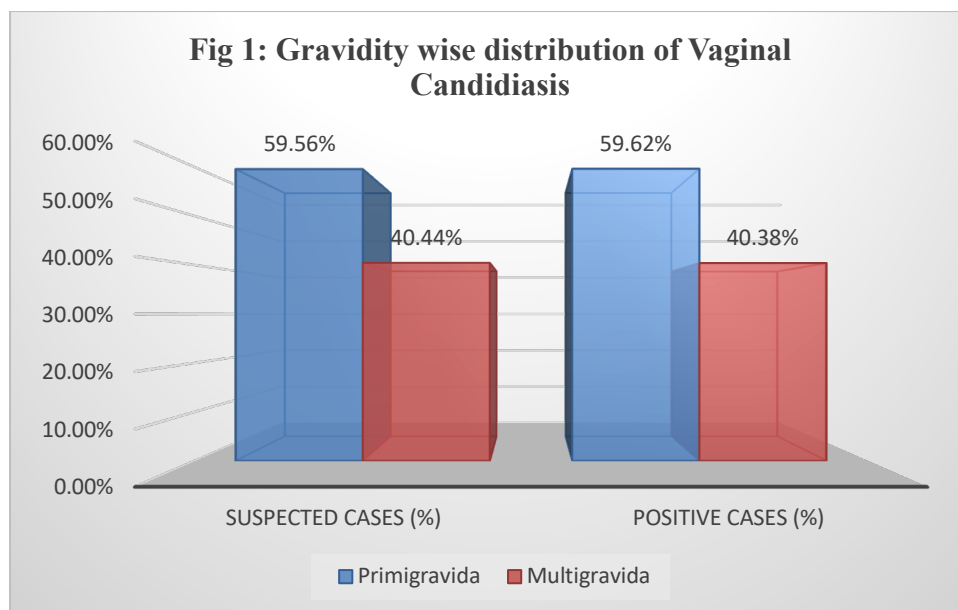


Figure 1:

Table 2: Candidiasis distribution in terms of gestation period

Gestational Period	Positive Cases (%)
1st Trimester	269 (24.02%)
2nd Trimester	614 (54.82%)
3rd Trimester	237 (21.16%)
Total	1120 (100%)

The majority of positive cases of candidiasis occurred during the 2nd trimester 614 (54.82%), followed by the 1st trimester 269 (24.02%), and the 3rd trimester 237 (21.16%).

In our study, 25% of positive cases were asymptomatic compared to 33.33% of negative cases (p-value: 0.001). Diabetes was present in 6.25% of positive and 2.3% of negative cases (p-

value: 0.125). Previous candidiasis was reported in 19.79% of positive and 21.46% of negative cases, while prior antibiotic use was noted in 16.07% of positive and 14.37% of negative cases.

HIV/AIDS was identified in 0.71% of positive and 1.15% of negative cases, with no risk factors reported in 60.18% of positive and 60.73% of negative cases.

Table 3: Clinical complaints and risk factors distribution among study population

Variable	Positive Cases (%)	Negative Cases (%)	p-value
Asymptomatic	280 (25.0%)	174 (33.33%)	0.001
Symptomatic	840 (75.0%)	348 (66.67%)	
Diabetes	70 (6.25%)	12 (2.3%)	0.125
Previous Candidiasis	188 (19.79%)	112 (21.46%)	
Previous Antibiotic Use	180 (16.07%)	75 (14.37%)	
HIV/AIDS	8 (0.71%)	6 (1.15%)	
None	674 (60.18%)	317 (60.73%)	
Total	1120 (100%)	522 (100%)	

In our study, all 1,120 positive Candida cases received vaginal hygiene management (100%), with 22 cases (2%) treated with antifungal cream and 1,098 cases (98%) managed using vaginal suppositories.

Table 4: Management of study subjects

Management Method	Positive Cases (n, %)
Vaginal Hygiene	1120 (100%)
Antifungal Cream	22 (2%)
Cotrimoxazole vaginal Pessary	1098 (98%)
Total	1120 (100%)

Discussion

The mean age of our participants was 24.2 years, with a standard deviation of 4.3 years, aligning with findings from other studies. Al-Rukeimi et al. [9] reported a similar mean age of 25.4 years among Yemeni pregnant women, with a high prevalence of vulvovaginal candidiasis (VVC) at 51.6%, while our study confirmed 1120 out of 1642 suspected cases as positive for Candida infection, reflecting a significant presence of the infection in a young population. Sule-Odu et al. [10] also noted a considerable Candida infection rate in pregnant women, particularly with *Candida albicans* as the predominant species, consistent with our findings.

In our study, 59.62% of the positive cases for Candida infection were primigravida, aligning with Al-Rukeimi et al. [9], who observed a higher prevalence of vulvovaginal candidiasis in primigravida women compared to multigravida. Similarly, Ghaddar et al. [11] found that primigravida women showed a higher rate of Candida colonization. [8] Idowu et al. reported that primigravida women were more prone to infections due to immunologic alterations during pregnancy. These findings suggest that primigravida women may be more susceptible to Candida infections due to physiological changes and hormonal shifts associated with the first pregnancy.

Our study found that the second trimester had the highest prevalence of candidiasis, accounting for 54.81% of positive cases, followed by the first trimester (24.04%) and the third trimester (21.15%). This trend aligns with Al-Rukeimi et al. (2020), who reported a significant association of vulvovaginal candidiasis with the second trimester, citing that hormonal changes, particularly increased estrogen levels, and heightened glycogen availability create a favorable environment for Candida growth. Ghaddar et al. [11] (2020) also observed similar patterns, noting that the second trimester is particularly susceptible due to immunologic alterations, which decrease the body's ability to counteract fungal overgrowth.

Moreover, Akibaniyi et al. [12] found that women in the second trimester were at a greater risk of infection due to the cumulative effect of physiological changes and increased blood sugar levels, which can promote yeast growth. Nahed et al. [11] corroborated these findings by indicating that the altered vaginal pH and microbiota during the second trimester increase the likelihood of Candida colonization.

Further supporting this, Ako et al. [13] demonstrated that the prevalence of Candida infections rises during the second trimester, likely due to the combined effect of reduced immune response and favorable hormonal conditions. Collectively, these studies suggest that the second

trimester is a critical period for heightened vigilance and possible preventive measures against candidiasis in pregnant women. In our study, 75% of the 1120 confirmed Candida-positive cases were symptomatic, while 25% were asymptomatic, contrasting with the negative cases where 33.33% were asymptomatic, and 66.67% were symptomatic, with a significant p-value of 0.001.

This finding is consistent with Ghaddar et al. [11], who reported a high prevalence of symptomatic Candida infections among pregnant women, highlighting the role of increased estrogen levels and immunologic changes in amplifying symptomatic responses.

Similarly, Al-Rukeimi et al. [9] found that 86.2% of women with vulvovaginal candidiasis exhibited clinical symptoms, such as vaginal discharge, itching, and pain, underlining the importance of recognizing these signs for early diagnosis and treatment. Mula et al. [14] emphasized that the symptoms often manifest more prominently in cases with higher fungal load and particular Candida species like *C. albicans*, which is more likely to cause symptomatic infections.

In line with this, Ako et al. [13] observed that the immunosuppressive state during pregnancy can lead to a higher percentage of symptomatic infections, with notable clinical presentations that necessitate medical attention. These findings collectively suggest that while asymptomatic Candida colonization is possible, symptomatic infections are more common during pregnancy due to physiological and hormonal changes, necessitating vigilant clinical monitoring and timely intervention.

In our study, diabetes was present in 6.25% of positive and 2.3% of negative cases (p-value: 0.125). Previous candidiasis was reported in 19.79% of positive and 21.46% of negative cases, while prior antibiotic use was noted in 16.07% of positive and 14.37% of negative cases. HIV/AIDS was identified in 0.71% of positive and 1.15% of negative cases, with no risk factors reported in 60.18% of positive and 60.73% of negative cases. These findings align with Al-Rukeimi et al. (2020), who reported that diabetes, particularly gestational diabetes, is a significant risk factor for vulvovaginal candidiasis due to increased glucose levels that enhance fungal growth, although in our study, the p-value for diabetes was not statistically significant (0.125). Similarly, Ghaddar et al. [11] highlighted the role of antibiotic use in disrupting normal vaginal flora, thereby promoting Candida overgrowth, consistent with our 21.15% prevalence of antibiotic use among positive cases.

The use of oral contraceptives, reported in 7.69% of our cases, was also noted by Mula et al. [14] to increase susceptibility to candidiasis due to

hormonal changes that favor fungal colonization. The low prevalence of HIV/AIDS (1.92%) among positive cases reflects findings from other studies, such as those by Disha et al. [4], which noted that while HIV/AIDS is a known risk factor, its contribution is relatively minor compared to other factors. In our study, all 1,120 positive *Candida* cases received vaginal hygiene management (100%), with 22 cases (2%) treated with antifungal cream and 1,098 cases (98%) managed using Cotrimoxazole vaginal Pessary. treatment with oral antifungal not recommended because of risk of causing congenital abnormalities in fetus.

This approach aligns with findings from Ghaddar et al. [11], who emphasized the importance of maintaining vaginal hygiene and the use of topical agents, like creams, to reduce *Candida* colonization effectively. Similarly, Al-Rukeimi et al. [9] highlighted that routine hygiene practices and the use of suppositories are key components in managing vulvovaginal candidiasis, which can mitigate the recurrence of infections.

Additionally, Mula et al. [14] underscored that targeted therapy, particularly in high-risk patients or those with recurrent infections, could help in reducing overall symptom burden and prevent complications. Collectively, these studies suggest that a tailored management approach, involving a combination of hygiene practices, localized treatment, and combination therapy, offers a balanced and effective strategy for managing *Candida* infections in a diverse patient population.

The limitations of our study includes that our study did not explore other potential risk factors, such as diet, lifestyle, or genetic predispositions, which could influence the prevalence and severity of *Candida* infections. The reliance on self-reported data for some risk factors may also introduce recall bias. Furthermore, our use of primarily localized treatment options without assessing long-term outcomes may limit our understanding of the efficacy of these management strategies over extended periods.

Conclusion

In conclusion, our study demonstrates that a comprehensive management approach involving universal vaginal hygiene and suppository use, combined with selective application of creams and combination therapy, effectively addresses *Candida* infections in pregnant women.

The use of targeted treatments aligns with the findings of previous studies, which emphasize the importance of individualized care to manage symptoms and prevent recurrence. By integrating various treatment modalities, our approach not only addresses the superficial symptoms but also targets

the underlying causes of *Candida* infections, particularly in high-risk and recurrent cases.

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