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Prevalence of bacterial vaginosis, vulvovaginal candidiasis and trichomoniasis among pregnant women with special reference to chlamydial infection

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ABSTRACT

Introduction: Vaginal infections are a common problem among pregnant women and can lead to adverse pregnancy outcomes. This study aimed to investigate the prevalence of vaginal infections among symptomatic and asymptomatic pregnant women in Odisha, India.

Materials and Methods: A total of 200 pregnant women aged 21-35 years attending the antenatal clinic of the Obstetrics and Gynaecology department were included in the study. A performa was prepared to collect data on patient history, personal hygiene, and associated comorbidities. Three high vaginal swabs and 2 ml of blood were collected from each patient and sent to the microbiology laboratory. The prevalence of vaginal infections was determined by analyzing the samples.

Results: Out of 200 samples processed, 30% were taken from symptomatic pregnant women and 70% were taken from asymptomatic pregnant women. The overall prevalence of vaginal infections was 59%. Vulvovaginal candidiasis (39%) was the most prevalent infection followed by bacterial vaginosis (30%). Mixed infection (VVC + BV) was found in 16% of the studied population. Chlamydial infection was found in 6% of the women. C. albicans (54%) was the predominant isolate, followed by C. tropicalis (28%). Adverse pregnancy outcomes noted in this study were preterm labor (5.9%) and premature rupture of membranes (2.54%). Vaginal infection had no significant association with adverse pregnancy outcome (P value = 0.971).

Conclusion: This study highlights the high prevalence of vaginal infections among pregnant women in Odisha, India. The findings emphasize the need for routine screening and appropriate treatment of vaginal infections during pregnancy to prevent adverse pregnancy outcomes. Further studies with larger sample sizes and additional diagnostic methods are needed to confirm these findings.

1. Introduction

Vaginal infections, including bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), trichomoniasis, and chlamydial infection, can significantly impact pregnant women, leading to adverse outcomes such as premature birth, low birth weight, and other complications. Bacterial vaginosis is the most common cause of abnormal vaginal discharge in pregnant women and is associated with an increased risk of premature birth and low birth weight.[1,2] Vulvovaginal candidiasis, characterized by symptoms such as curd-like vaginal discharge, itching, and burning sensation, is also a common concern during pregnancy,

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with potential adverse effects on pregnancy outcomes. Trichomoniasis and chlamydial infection can lead to serious complications in pregnancy, including preterm delivery, low birth weight, and infertility. It's important for pregnant women to seek timely medical attention and treatment for these infections to mitigate the associated risks.[3,4]

The prevalence of these infections varies among the population of interest, and they are important causes of morbidity in pregnant women. Bacterial vaginosis, in particular, is linked to an imbalance in the vaginal ecosystem, leading to an excessive growth of certain bacteria and a decrease in the number of Lactobacilli, which are essential for maintaining normal vaginal flora. The use of antibiotics is a common treatment for BV during pregnancy, and it is important for pregnant women to complete the full course of treatment to reduce the risk of adverse outcomes.[5]

Overall, these vaginal infections can have significant implications for maternal and fetal health during pregnancy, and it's crucial for healthcare providers to screen for, diagnose, and effectively manage these conditions to ensure the best possible outcomes for both the mother and the baby.

2. Materials and Methods

The study was conducted in the Department of Microbiology at SCB Medical College and Hospital in Cuttack, Odisha, in collaboration with the Department of Obstetrics and Gynaecology. It was done to determine the prevalence of bacterial vaginosis, vulvovaginal candidiasis, trichomoniasis and chlamydial infection among pregnant women, to find out gestational age distribution of vaginal infections, species specific distribution of vulvovaginal candidiasis and the effect of these infections on pregnancy outcome.

The study included 200 pregnant women between the ages of 21 and 35 over a period of 18 months, from April 2021 to September 2022. A performa was prepared to collect patient history, including age, sex, address, personal history, and associated comorbidities. The inclusion criteria were pregnant women between the ages of 21 and 35 attending the antenatal clinic of the O&G department. The exclusion criteria were pregnant women under 21 years of age or over 35 years of age, those with a previous history of adverse pregnancy outcomes, those on antibiotic therapy, and those with other underlying risk factors. Written consent was obtained from the patients after providing detailed information about the study. Three high vaginal swabs (HVS) and 2 ml of blood sample were collected from each patient and immediately sent to the microbiology laboratory for processing.

3. Results

The study was conducted at the Department of Microbiology, SCB Medical College and Hospital, in collaboration with the Department of Obstetrics and Gynaecology. A total of 200 pregnant women, aged 21-35, were included in the study over an 18-month period. Out of the 200 samples processed, 30% were from symptomatic pregnant women, and 70% were from asymptomatic pregnant women. The overall prevalence of vaginal infections was 59%.

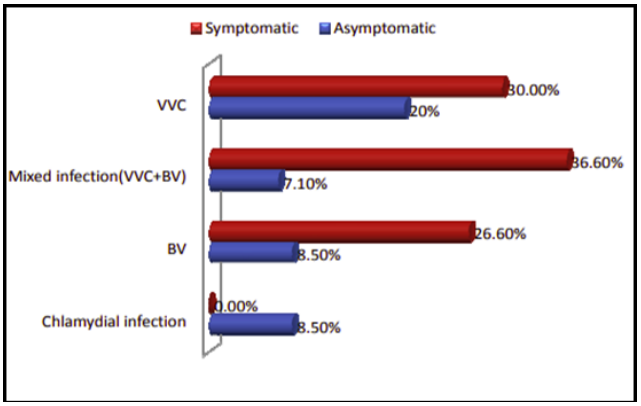

Figure 1: Prevalence of vaginal infection among symptomatic and asymptomatic pregnant women (n=60+140)

Among the symptomatic pregnant women, itching (80%) was the most common symptom, followed by abnormal vaginal discharge (72%). Vulvovaginal candidiasis (VVC) was the most prevalent infection (39%), followed by bacterial vaginosis (30%). Mixed infection (VVC + BV) was found in 16% of the studied population, and chlamydial infection had a prevalence of 6%. Notably, trichomoniasis was not found in the study.(Table 1)

Table 1: Prevalence of different vaginal infections among pregnant women (n=200)

Vaginal infection	No.(%)
Vulvovaginal candidiasis	46(23)
Mixed infection (VVC+ BV)	32(16)
Bacterial vaginosis	28(14)
Chlamydial infection	12(6)
Trichomoniasis	0(0)
Total	118(59)

The prevalence of vaginal infections varied by age group and trimester. The highest prevalence of vaginal infections was seen in the age group 26-30, and the overall highest prevalence was observed in the 3rd trimester. Vaginal infection was more prevalent in symptomatic pregnant women (93.3%) compared to asymptomatic pregnant women (44.2%).

Candida albicans (54%) was the predominant isolate among all Candida species, and among non-albicans Candida species, Candida tropicalis (28%) was the most frequently isolated species. Out of 118 positive vaginal infections, 5.9% had preterm labor, and 2.54% had premature rupture of membranes (PROM). Chlamydial infection (16.6%) was the predominant cause of adverse pregnancy outcomes.(Table 2)

In summary, the study provides valuable insights into the prevalence and distribution of different vaginal infections among pregnant women, as well as their association with symptoms and adverse pregnancy outcomes. The findings underscore the importance of timely and accurate diagnosis, as well as appropriate management of these infections during pregnancy to mitigate potential risks to maternal and fetal health.

4. Discussion

This study aimed to investigate the prevalence and associated factors of vaginal infections among pregnant women in Odisha, India. The results revealed a high prevalence of vaginal infections (59%), with itching (80%) and abnormal vaginal discharge (72%) being the most common symptoms.[6]

The study found that vulvovaginal candidiasis (39%) was the most prevalent infection, followed by bacterial vaginosis (30%). This finding is consistent with other studies (Dennis Gyasi Konadu et al).,[7] but the prevalence of bacterial vaginosis varied among studies, which may be due to differences in population and diagnostic methods.[8]

Mixed infections (VVC plus BV) were found in 16% of the studied population, which is similar to other studies (Olugbenga Adekunle Olowe et al. and Shrestha et al).[1,9] Trichomoniasis was not found in this study, which may be due to the small size of the study population.

The study found that chlamydial infection was present in 6% of the pregnant women, which is consistent with other studies. (N. K. Vidwan et al).,[10] but higher prevalence was found in other studies by Yashodhara et al. and C. Anitha et al.[11,12] 29.8% and 25.22% respectively.

The study found that the third trimester had the highest prevalence of vaginal infections (84.4%), which is consistent with other studies. s (Olugbenga Adekunle Olowe et al., and Nelson Menja et al).[1,13] The second trimester had the highest prevalence of bacterial vaginosis, while the first trimester had the highest prevalence of chlamydial infection.

The study found that vaginal infections were more prevalent in symptomatic pregnant women (93.3%), while asymptomatic pregnant women had a lower prevalence (44.2%). Among symptomatic pregnant women, mixed infections (VVC plus BV) were found most prevalent, followed by VVC and BV. Among asymptomatic pregnant women, VVC was found most prevalent, followed by BV and chlamydial infection.[14]

The study found that C. albicans (54%) was the predominant isolate among Candida species. This is supported by the findings of other studies (Nelson Menja et al., Akinbami Abidemi Nurat et al).[13,15] While C. tropicalis (28%) was the most frequently isolated non-albicans Candida species. The study found no significant association between vaginal infections and adverse pregnancy outcomes (P value = 0.971).

The study has some limitations, such as a small sample size and the absence of additional diagnostic methods like culture for bacterial vaginosis and PCR for trichomoniasis and chlamydial infections. Despite these limitations, the study provides valuable insights into the prevalence and associated factors of vaginal infections among pregnant women in Odisha, India. Further studies with larger sample sizes and additional diagnostic methods are needed to confirm these findings and to better understand the complex interplay between vaginal infections and adverse pregnancy outcomes.

5. Conclusion

The study revealed a high prevalence of vaginal infections among pregnant women, with vulvovaginal candidiasis (VVC) and mixed infections (BV+VVC) being the most common. The prevalence of vaginal infections was notably higher in the third trimester, and C. albicans was the predominant isolate among all Candida species. The prevalence of vaginal infections was higher in symptomatic pregnant women, except for chlamydial infection, which was only found in asymptomatic pregnant women. The absence of trichomoniasis in the study suggests that a larger sample size and more sensitive diagnostic methods, such as PCR, may be necessary for accurate diagnosis. Adverse pregnancy outcomes, such as preterm labor and premature rupture of membranes, were noted in the study, but no significant association with vaginal infection was found. These findings underscore the importance of regular screening for vaginal infections in both symptomatic and asymptomatic pregnant women, as well as the need for structured screening programs to educate pregnant women about the risks and prevention of vaginal infections. Early diagnosis and adequate treatment are crucial for preventing adverse pregnancy outcomes, and the identification of Candida species can contribute to more effective treatment strategies.

6. Source of Funding

None.

7. Conflict of Interest

None.

Table 2: Adverse pregnancy outcome in vaginal infections (n=28+46+32+12=118)

Vaginal infection	Preterm labor No.(%)	Premature rupture of membrane No.(%)	Total No.(%)	P value
Bacterial vaginosis	1(3.57)	1(3.57)	2(7.14)	0.971
VVC	1(2.1)	0(0)	1(2.1)	
Mixed infection (BV=VVC)	4(12.5)	1(3.1)	5(15.6)	
Chlamydial infection (C.I)	1(8.3)	1(8.3)	2(16.6)	

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