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FREQUENCY OF BACTERIAL VAGINOSIS IN PREGNANT WOMEN COMING TO A TERTIARY CARE HOSPITAL

Original Research

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ABSTRACT

Background: Bacterial vaginosis is the most common vaginal infection in women of reproductive age, contributing significantly to vaginal discharge and malodor. It is associated with adverse obstetric and gynecologic outcomes, including preterm labor, premature rupture of membranes, spontaneous abortion, chorioamnionitis, postpartum endometritis, and increased susceptibility to sexually transmitted infections. The reported prevalence of bacterial vaginosis varies widely across populations, necessitating further epidemiological assessment in different settings to guide clinical management and preventive strategies.

Objective: To determine the frequency of bacterial vaginosis in pregnant women presenting to a tertiary care hospital.

Methods: This descriptive cross-sectional study was conducted in the Obstetrics and Gynaecology Department of Sheikh Zayed Hospital, Lahore, over six months following ethical approval. A total of 270 pregnant women aged 18-40 years, irrespective of gestational age and parity, were recruited using a non-probability consecutive sampling technique. Patients with a prior history of bacterial vaginosis or recent antibiotic use were excluded. Diagnosis was based on Amsel's criteria, and data were recorded on a structured proforma. Statistical analysis was performed using SPSS version 16.

Results: Among 270 pregnant women, 70.37% (n=190) were aged 18-30 years, while 29.63% (n=80) were 31-40 years, with a mean age of 27.37 ± 4.92 years. The mean gestational age was 38.10 ± 1.48 weeks, with 15.93% (n=43) of women having gestation <37 weeks and 84.07% (n=227) ≥37 weeks. Bacterial vaginosis was identified in 15.56% (n=42) of cases, while 84.44% (n=228) tested negative. Stratification showed higher prevalence in rural residents (19.72%) compared to urban (10.57%) (p=0.03) and among those with gestation <37 weeks (32.56%) compared to ≥37 weeks (12.39%) (p=0.0008).

Conclusion: Bacterial vaginosis was observed in a considerable proportion of pregnant women, though the frequency was lower than reported in some previous local studies. Given its implications for maternal and neonatal health, further research is warranted to validate these findings and optimize screening and management strategies.

Keywords: Bacterial vaginosis, gestational age, maternal health, pregnancy, prevalence, reproductive health, vaginal infection.

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INTRODUCTION

Bacterial vaginosis (BV) is the most common cause of vaginal discharge in women, with prevalence rates reported between 10% and 31% (1). It is a significant concern among women of reproductive age worldwide, though its frequency varies across different populations (2). BV can present as both symptomatic and asymptomatic, making it a prevalent yet often underdiagnosed condition. Despite its asymptomatic nature in many cases, BV remains one of the leading causes of vaginitis and is a frequent reason for women seeking medical attention. Alongside vulvovaginal candidiasis, BV constitutes a major gynecological issue, particularly due to its potential complications, which extend beyond discomfort and discharge to serious reproductive and obstetric concerns (3). In recent years, BV has emerged as a global health concern due to its association with ascending genital tract infections and an increased risk of acquiring sexually transmitted infections, including human papillomavirus (HPV), herpes simplex virus type 2 (HSV-2), *Trichomonas vaginalis*, *Neisseria gonorrhoeae*, and human immunodeficiency virus (HIV) (3,4). Furthermore, BV has been linked to adverse pregnancy outcomes such as preterm birth, low birth weight, chorioamnionitis, postpartum endometritis, and pelvic inflammatory disease (5). The impact of BV on maternal and neonatal health underscores the need for continued research and clinical vigilance.

In Pakistan, the reported frequency of BV in pregnant women varies considerably, with studies documenting prevalence rates ranging from 17.3% to as high as 68% (6,7). A recent study from Larkana found that 64.1% of pregnant women tested positive for BV, highlighting significant regional variations in prevalence (8). Given the substantial discrepancies in reported data, there is a pressing need for further research to establish a more accurate frequency of BV among pregnant women in different populations. This study aims to address this gap by determining the frequency of BV in pregnant women presenting to a tertiary care hospital. The findings will contribute to a better understanding of BV's burden in this population and inform future clinical guidelines for its management (9).

METHODS

A descriptive cross-sectional study was conducted in the Obstetrics and Gynaecology Department of Sheikh Zayed Hospital, Lahore, over a period of six months following the approval of the synopsis by the hospital's ethical review board. The study aimed to determine the frequency of bacterial vaginosis in pregnant women. A sample size of 270 participants was calculated based on an 80% power of test, a 3% margin of error, and an expected prevalence of 17.3% for bacterial vaginosis in pregnant women. A non-probability consecutive sampling technique was used to recruit participants (10). Pregnant women aged 18 to 40 years, irrespective of gestational age and parity, were included in the study. Exclusion criteria comprised patients with a prior history of bacterial vaginosis or those who had received antibiotic treatment within the preceding two weeks to eliminate potential confounding effects. Patients meeting the inclusion criteria were recruited from the outpatient department after obtaining informed written consent. Ethical approval was secured from the hospital's ethical committee before study initiation (11).

Data collection was performed by the researcher using a pre-designed proforma. Each participant was evaluated for bacterial vaginosis based on predefined operational criteria. Demographic variables such as age, gestational age, parity, body mass index (BMI), socioeconomic status, educational level, and residential area (rural or urban) were also recorded (12). The collected data were entered and analyzed using SPSS version 16. Mean and standard deviation were calculated for continuous variables, including age, gestational age, parity, and BMI. Categorical variables, such as the presence of bacterial vaginosis, socioeconomic status, residential area, and educational level, were expressed as frequencies and percentages. Data stratification was performed based on age, gestational age, parity, BMI (<30 and >30), socioeconomic status (poor, middle, higher), educational status (under matric, matric, intermediate, graduate, master's), and residential area (rural or urban) to control potential confounders. Patients meeting the exclusion criteria were systematically omitted from the analysis (13).

RESULTS

A total of 270 pregnant women fulfilling the inclusion criteria were enrolled in the study to determine the frequency of bacterial vaginosis. The age distribution of participants showed that 70.37% (n=190) were between 18-30 years, while 29.63% (n=80) were between 31-40 years, with a mean age of 27.37 ± 4.92 years. Gestational age analysis revealed that 15.93% (n=43) had a gestational age of less than 37 weeks, while 84.07% (n=227) were at or beyond 37 weeks, with a mean gestational age of 38.10 ± 1.48 weeks. Regarding

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parity, 71.11% (n=192) of the participants had between 1-3 pregnancies, while 28.89% (n=78) had more than 3 pregnancies, with a mean parity of 2.61 ± 1.13. The overall frequency of bacterial vaginosis among pregnant women was recorded as 15.56% (n=42), while 84.44% (n=228) had no findings of this condition.

Stratification of bacterial vaginosis by gestational age indicated a significantly higher prevalence among those with gestational age less than 37 weeks (32.56%) compared to those beyond 37 weeks (12.39%) (p=0.0008). When stratified by parity, bacterial vaginosis was more frequent in women with 1-3 pregnancies (17.19%) compared to those with more than 3 pregnancies (11.54%), though this difference was not statistically significant (p=0.24). Socioeconomic status analysis showed that bacterial vaginosis was more common in the poor socioeconomic group (20.6%) compared to the middle (9.3%) and higher socioeconomic groups (14.3%), with a p-value of 0.06. Residential area stratification demonstrated a significantly higher prevalence of bacterial vaginosis in rural residents (19.72%) compared to urban residents (10.57%) (p=0.03).

Table 1: Frequency of Bacterial Vaginosis In Pregnant Women

Bacterial vaginosis	No. of patients	%
Yes	42	15.56
No	228	84.44
Total	270	100

Table 2: Stratification for Frequency of Bacterial Vaginosis In Pregnant Women With Regards To Gestational Age

Gestational age (in weeks)	Bacterial vaginosis		P value
	Yes	No	
<37	14	29	0.0008
>37	28	199	

Table 3: Stratification for Frequency of Bacterial Vaginosis in Pregnant Women With Regards To Gestational Parity

Parity	Bacterial vaginosis		P value
	Yes	No	
1-3	33	159	0.24
>3	9	69	

Table 4: Stratification for Frequency Of Bacterial Vaginosis In Pregnant Women With Regards To Socioeconomic Status

Socioeconomic status	Bacterial vaginosis		P value
	Yes	No	
Poor	27	104	0.06
Middle	9	88	
Higher	6	36	

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Table 5: Stratification for Frequency of Bacterial Vaginosis In Pregnant Women With Regards To Residential Area

Residential area	Bacterial vaginosis		P value
	Yes	No	
Rural	29	118	0.03
Urban	13	110	

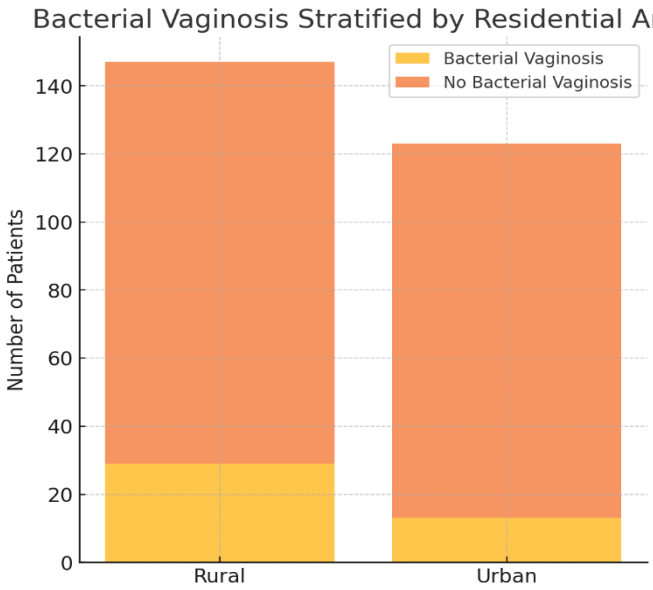

Figure 1 Bacterial Vaginosis Stratified by Residential Area

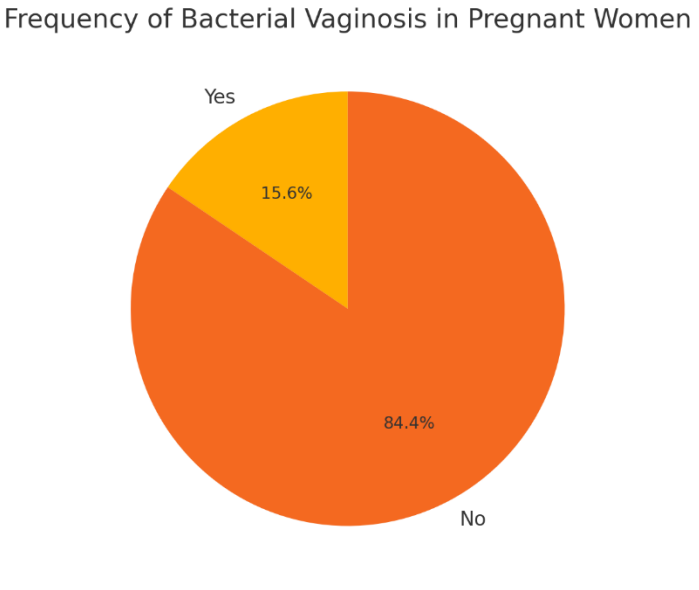

Figure 2 Frequency of Bacterial Vaginosis in Pregnant Women

DISCUSSION

Bacterial vaginosis is the most common lower genital tract disorder among women of reproductive age and remains a significant concern in both pregnant and non-pregnant populations. It is the leading cause of vaginal discharge and malodor and has been linked to a variety of obstetric and gynecologic complications, including preterm labor, preterm premature rupture of membranes, spontaneous abortion, chorioamnionitis, postpartum endometritis, and post-surgical infections. The impact of bacterial vaginosis on maternal and neonatal health underscores the need for continued epidemiological studies to assess its frequency and risk factors in different populations (14-16). In the present study, the frequency of bacterial vaginosis among pregnant women was recorded as 15.56%, which is within the range reported in previous studies but lower than certain earlier reports. Studies conducted in Pakistan have documented varying prevalence rates, with some reporting bacterial vaginosis in up to 68% of pregnant women, a figure considerably higher than the findings of this study. The variability in reported prevalence may be attributed to differences in study populations, diagnostic methods, and evolving healthcare awareness over time. A study conducted in 2008 reported significantly higher prevalence rates, which may reflect limited awareness and access to healthcare facilities at that time. Conversely, a study assessing bacterial vaginosis in pregnant women with abnormal vaginal discharge found a prevalence of 17.3%, which aligns more closely with the current findings. Similarly, a recent study from Larkana reported a prevalence of 64.1%, highlighting regional variations in bacterial vaginosis prevalence across different healthcare settings (17-19).

Bacterial vaginosis has been observed at a higher frequency in populations attending sexually transmitted disease clinics, with prevalence rates reported as high as 61%. In contrast, private clinic populations have demonstrated lower prevalence rates, ranging from 4% to 17%, while studies conducted in gynecological clinics catering to lower-income women have reported rates of up to 23%. The prevalence in college students has been documented between 4% and 25%, and studies in pregnant women have reported rates between 6% and 32%, demonstrating a broad variation depending on population characteristics. A Canadian study among maternity patients reported an

overall bacterial vaginosis prevalence of 14%, which is closely comparable to the findings of this study (20-22). Epidemiological studies have identified early sexual activity, multiple lifetime sexual partners, and a history of sexually transmitted infections as significant risk factors for bacterial vaginosis. The coexistence of bacterial vaginosis with sexually transmitted infections, particularly *Trichomonas vaginalis*, has been well documented. The development of bacterial vaginosis is often associated with disruptions in normal vaginal flora, particularly the depletion of *Lactobacillus* species, leading to the overgrowth of anaerobic bacteria. Although bacterial vaginosis is not classified as a sexually transmitted disease, sexual behaviors influence its occurrence by altering vaginal microbiota and facilitating the proliferation of pathogenic organisms (23-25).

The strengths of this study include its standardized methodology, adequate sample size, and stratification of bacterial vaginosis by key demographic and clinical parameters. The study provides valuable epidemiological data on the burden of bacterial vaginosis in pregnant women, contributing to the existing literature on this topic. However, certain limitations should be acknowledged. The study did not account for sexually transmitted infections, which are known to influence the prevalence of bacterial vaginosis. Additionally, stratification by body mass index and educational status, which were outlined as potential confounding factors, was not performed, limiting a comprehensive understanding of their impact on bacterial vaginosis prevalence. The use of Amsel's criteria for bacterial vaginosis diagnosis, although widely accepted, may also introduce variability when compared with the more sensitive Nugent scoring system used in some studies (26-29). Future research should focus on exploring the role of sexually transmitted infections, socioeconomic factors, and dietary influences in bacterial vaginosis development. A longitudinal approach assessing bacterial vaginosis progression throughout pregnancy and its impact on neonatal outcomes would further enhance the understanding of its clinical significance. Incorporating molecular diagnostic techniques for bacterial vaginosis detection may improve accuracy and allow for a better characterization of microbial imbalances associated with this condition.

CONCLUSION

The study determined that bacterial vaginosis remains a prevalent condition among pregnant women, though its frequency in this population was lower than reported in some other local studies. The findings contribute to the understanding of bacterial vaginosis in a tertiary care setting and highlight the need for continued research to validate these results across diverse populations. Given its potential implications for maternal and neonatal health, further investigations are essential to refine screening strategies and optimize management protocols, ultimately improving pregnancy outcomes and reducing associated complications.

AUTHOR CONTRIBUTIONS

Author	Contribution
Farhana Shabnam*	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Asma Irshad Gulab	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Ayesha Hameed	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Ammara Ishtiaq	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Saba Ajmal	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Muhammad Nauman Saleem	Substantial Contribution to study design and Data Analysis Has given Final Approval of the version to be published

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