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Prevalence of Bacterial Vaginosis, Vulvovaginal Candidiasis, and Trichomoniasis in Reproductive - Age Women - A Microbiological and Clinical Correlation Study.

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Abstract

Background: Bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), and Trichomoniasis are common causes of lower genital tract symptoms in reproductive-age women. Their clinical manifestations may overlap considerably, making microbiological evaluation important for accurate diagnosis and appropriate management.

Aim: To determine the prevalence of bacterial vaginosis, vulvovaginal candidiasis, and Trichomoniasis among reproductive-age women and to correlate the microbiological findings with their clinical presentation.

Materials and Methods: A prospective observational study was conducted among 52 reproductive-age women presenting with genital complaints. Relevant demographic and clinical details were recorded. Vaginal specimens were collected using standard procedures and examined by appropriate microbiological methods, including microscopic examination for clue cells, fungal elements, and Trichomoniasis vaginalis. The microbiological findings were correlated with the presenting clinical features.

Results: Among the 52 women evaluated, 7 (13.46%) showed microbiological evidence of genital infection, while 45 (86.54%) were negative. Bacterial vaginos is was identified in 3 cases (5.77%), vulvovaginal candidiasis in 3 cases (5.77%), and Trichomoniasis in 1 case (1.92%). Vaginal discharge was the most common presenting symptom, reported by 31 (59.62%) participants. The highest number of positive cases was observed in the 26–30-year age group, with 3 positive cases (17.65%). Among the positive cases, BV and VVC each constituted 42.86%, while Trichomoniasis accounted for 14.29%.

Conclusion: The study demonstrates that 13.46% of reproductive-age women had microbiologically detectable genital infections, with bacterial vaginosis and vulvovaginal candidiasis being the predominant conditions. Vaginal discharge was the most frequent clinical presentation. Since clinical symptoms may overlap among different infections, micro biological examination remains valuable for accurate diagnosis and appropriate treatment.

Keywords: Bacterial Vaginosis, Vulvovaginal Candidiasis, Trichomoniasis, Reproductive-Age Women, Vaginal Discharge, Microbiological Diagnosis.

Introduction

Vaginal infections are among the most frequent causes of morbidity in women of reproductive age and represent an important public-health concern because of their effect on sexual and reproductive health. Women may present with vaginal discharge, itching, irritation, burning, unpleasant odour, dysuria, dyspareunia, or may remain completely asymptomatic. These clinical manifestations frequently overlap between different etiological conditions, making diagnosis based solely on symptoms and clinical examination difficult. Appropriate laboratory evaluation is therefore important for establishing the underlying cause and guiding effective management[1,2]. Vaginitis and vaginal dysbiosis are commonly associated with three major conditions—bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), and Trichomoniasis. Although these conditions differ in their causative organisms and pathogenesis, they may produce similar clinical manifestations. The Centers for Disease Control and Prevention (CDC) emphasizes that clinical history alone is often insufficient to accurately diagnose vaginitis and recommends appropriate examination and laboratory testing when indicated [2].

Bacterial vaginosis is a common vaginal condition characterized by a disturbance of the normal vaginal microbial ecosystem, with reduction of protective lactobacilli and increased abundance of anaerobic organisms. Organisms associated with BV include Gardnerella vaginalis, Prevotella species, Atopobium vaginae, Megasphaera species and other anaerobic bacteria [2,3]. BV may be asymptomatic or may present with a thin, homogeneous vaginal discharge and a characteristic vaginal odour. Diagnosis can be made using established clinical criteria such as Amsel criteria or by laboratory-based methods such as Gram-stained vaginal smears interpreted using the Nugent scoring system [3,4]. The clinical importance of BV extends beyond vaginal symptoms. BV has been associated with an increased risk of acquiring several sexually transmitted infections and may be associated with adverse reproductive and pregnancy - related outcomes. Consequently, recognition and appropriate treatment of symptomatic BV are important components of women's reproductive healthcare[3,5].

Vulvovaginal candidiasis is another common cause of lower genital tract symptoms in women. It is most

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frequently caused by Candida albicans, although other Candida species can also be responsible. Typical manifestations include vulval pruritus, soreness, erythema, external dysuria, dyspareunia and abnormal vaginal discharge. However, none of these symptoms is specific for candidiasis, and confirmation by microscopy or culture may be necessary in appropriate clinical situations[6]. Microscopic examination of vaginal secretions may demonstrate budding yeast cells, pseudohyphae or hyphae in women with VVC. A wet preparation using saline or potassium hydroxide can facilitate identification of fungal elements. Importantly, the mere presence of Candida organisms without compatible symptoms does not necessarily indicate symptomatic vulvovaginal candidiasis, because vaginal colonization can occur in otherwise healthy women6. Therefore, microbiological findings should be interpreted together with the clinical presentation. Trichomoniasis, caused by the flagellated protozoan Trichomonas vaginalis, is one of the most common curable sexually transmitted infections worldwide. The World Health Organization estimated approximately 156 million new T. vaginalis infections among people aged 15–49 years in 2020, highlighting the substantial global burden of this infection7. In women, Trichomoniasis may manifest as abnormal vaginal discharge, vulval irritation, itching, dysuria or dyspareunia, although asymptomatic infections are also common7,8. Diagnosis of Trichomoniasis may be performed by direct microscopic examination, antigen detection or molecular methods such as nucleic acid amplification tests. Although wet- mount microscopy is relatively simple and inexpensive, its sensitivity is lower than that of molecular diagnostic methods. Therefore, the diagnostic approach should be selected according to the clinical setting and availability of laboratory facilities.[8,9]

The burden of sexually transmitted and reproductive tract infections remains substantial worldwide. WHO reports that more than one million curable sexually transmitted infections are acquired every day among people aged 15–49 years, with many infections remaining asymptomatic[10]. The consequences of untreated infections can extend beyond immediate genital symptoms and may include pelvic inflammatory disease, infertility, adverse pregnancy outcomes and increased susceptibility to HIV acquisition [10,11].

Pregnancy and the reproductive period are particularly important settings for identification and management of genital infections. Certain genital infections have been associated with adverse pregnancy outcomes, including preterm birth, premature rupture of membranes and low birth weight. In addition, infection during pregnancy may have implications for maternal and neonatal health [5,7]. Early identification of clinically significant infections can therefore contribute to better reproductive and obstetric outcomes. A major diagnostic challenge is the considerable overlap in clinical presentation between BV, VVC and Trichomoniasis. Vaginal discharge, itching, irritation, burning and odour may occur with more than one condition, and individual symptoms have limited specificity for determining the causative organism [2,6]. Consequently, empirical treatment based solely on symptoms may result in inappropriate therapy, missed infections or unnecessary antimicrobial exposure. Laboratory confirmation can improve diagnostic accuracy and facilitate targeted treatment.

The use of microscopy remains particularly relevant in resource-limited and routine microbiology settings because it is inexpensive, relatively rapid and can provide useful information regarding clue cells, fungal elements and T. vaginalis. Gram staining and Nugent

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scoring can assist in diagnosing BV, while wet-mount or potassium hydroxide preparations can aid in the detection of fungal elements. Molecular methods provide increased sensitivity for selected infections but may not be readily available in all healthcare facilities[3,6,8].

Another important consideration is the increasing need for rational antimicrobial use. Appropriate identification of the underlying cause of vaginal symptoms helps clinicians select suitable therapy and avoid unnecessary or inappropriate antimicrobial treatment. Current clinical guidelines recommend etiological assessment and appropriate management based on the specific diagnosis and individual patient circumstances [1,2].

Despite the clinical importance of these infections, their prevalence varies considerably according to geographical location, population characteristics, age, reproductive status, sexual health practices and diagnostic methodology. Local epidemiological studies are therefore valuable for determining the frequency and distribution of these conditions within specific populations. Such data can assist healthcare providers in understanding the local burden of disease and developing appropriate diagnostic and therapeutic strategies.

The present study was undertaken to determine the prevalence of bacterial vaginosis, vulvovaginal candidiasis and Trichomoniasis among reproductive-age women and to evaluate the relationship between microbiological findings and clinical presentation. By correlating symptoms and laboratory findings, the study aims to highlight the importance of microbiological diagnosis in women presenting with vaginal complaints and to provide locally relevant data regarding the occurrence of these common genital infections.

Materials and methods

Study Design and Setting

A prospective observational study was conducted to determine the prevalence of bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), and Trichomoniasis among reproductive-age women. The study was conducted in the Department of Microbiology in collaboration with the concerned clinical department during the study period of 12 months at a tertiary care centre.

Study Population

The study included 52 women of reproductive age who attended the hospital with symptoms suggestive of lower genital tract infection or were evaluated for vaginal infection. Relevant demographic and clinical information was recorded using a structured data collection proforma.

Inclusion Criteria

Women were included if they

1. Were of reproductive age.
2. Presented with symptoms suggestive of vaginal infection, such as abnormal vaginal discharge, itching, burning, irritation or vaginal odour.
3. Were willing to participate in the study and provide the required clinical specimens.
4. Had adequate vaginal specimens available for microbiological examination.

Clinical Assessment

A detailed clinical history was obtained from each participant, including age, parity, presenting complaints, duration of symptoms and relevant obstetric/ gynecological history. Symptoms such as vaginal discharge, vulval itching, burning sensation, vaginal odour, lower abdominal discomfort and dyspareunia

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were documented. Where clinically indicated, examination findings were also recorded.

Specimen Collection

After obtaining informed consent, vaginal specimens were collected using sterile vaginal **swabs** under appropriate aseptic precautions. Samples were collected from the vaginal walls/posterior fornix while avoiding contamination. Separate specimens were used for direct microscopic examination and other laboratory investigations as required.

Direct Microscopic Examination

A portion of the vaginal specimen was examined by saline wet mount preparation for the detection of motile Trichomonas vaginalis organisms and other cellular findings. A potassium hydroxide preparation was used, where appropriate, to demonstrate budding yeast cells and pseudohyphae**,** suggestive of vulvovaginal candidiasis.

Diagnosis of Bacterial Vaginosis

Bacterial vaginosis was assessed using established clinical and microscopic criteria. The vaginal discharge was evaluated for characteristics such as homogeneity and odour, and microscopy was performed for the presence of clue cells**.** Where Gram-stained smears were available, the vaginal flora was assessed using the Nugent scoring system**.** A Nugent score of 7–10 was considered consistent with bacterial vaginosis.

Diagnosis of Vulvovaginal Candidiasis

Vulvovaginal candidiasis was diagnosed on the basis of compatible clinical findings together with demonstration of yeast cells, budding yeast or pseudohyphae/hyphae on microscopic examination. The microbiological findings were interpreted in conjunction with the clinical presentation to distinguish infection from asymptomatic colonization.

Diagnosis of Trichomoniasis

Trichomoniasis was diagnosed by demonstration of characteristic motile, flagellated trichomonads on saline wet-mount microscopy. The finding was correlated with the patient's clinical presentation.

Data Collection and Analysis

All demographic, clinical and laboratory findings were entered into a structured data sheet and analyzed descriptively. Categorical variables were expressed as frequency and percentage**.** The overall prevalence of infection was calculated as the number of microbiologically positive cases divided by the total number of women studied.

The final analysis included 52 participants**,** of whom 7 were microbiologically positive and 45 were negative**.**

Results

A total of 52 reproductive-age women were included in the study. Among the 52 women investigated, 7 (13.46%) were positive for one of the studied genital infections, while 45 (86.54%) were negative.

Table 1: Distribution of study participants according to age

Age group (years)	No. of cases	Percentage
18–25	14	26.92%
26–30	17	32.69%
31–35	13	25.00%
36–40	8	15.38%
Total	52	100%

The majority of participants belonged to the 26–30-year age group (32.69%)**,** followed by 18–25 years (26.92%). Out of the 52 women included in the study, the majority belonged to the 26–30-year age group, comprising 17 (32.69%) participants. This was followed by women aged 18–25 years, who accounted for 14 (26.92%) cases, and those aged 31–35 years, comprising 13 (25.00%) cases. Eight (15.38%) participants were in the 36–40-

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year age group. Thus, the study population predominantly consisted of women in the reproductive age group of 26–30 years.

Table 2: Distribution according to parity

Parity	No. of cases	Percentage
Primigravida	19	36.54%
1–2 previous births	22	42.31%
≥3 previous births	11	21.15%
Total	52	100%

Among the 52 participants, 22 (42.31%) had 1–2 previous births, representing the largest parity group. Nineteen (36.54%) were Primigravida, while 11 (21.15%) had three or more previous births.

Therefore, women with 1–2 previous births constituted the predominant group in the present study.

Table 3: Distribution according to presenting symptoms

Clinical symptom	No. of cases	Percentage
Vulval itching	18	34.62%
Burning sensation	12	23.08%
Vaginal odour	9	17.31%
Lower abdominal discomfort	7	13.46%
Dyspareunia	5	9.62%
Asymptomatic	10	19.23%

Vaginal discharge was the most frequently reported symptom, present in 31 (59.62%) women. Vaginal discharge was the most common presenting symptom, reported by 31 (59.62%) women. Vulval itching was reported by 18 (34.62%), followed by burning sensation in 12 (23.08%) and vaginal odour in 9 (17.31%) participants. Lower abdominal discomfort was reported by 7 (13.46%) women and dyspareunia by 5 (9.62%). Ten (19.23%) women were asymptomatic at presentation. The findings indicate that abnormal vaginal discharge was the predominant clinical complaint among the study participants.

Table 4: Overall microbiological findings

Microbiological finding	No. of cases	Percentage
Positive	7	13.46%
Negative	45	86.54%
Total	52	100%

Microbiological examination revealed that 7 out of 52 women (13.46%) were positive for one of the infections investigated, whereas 45 (86.54%) showed no specific microbiological evidence of infection. Thus, although the majority of participants were negative, a measurable proportion of reproductive-age women had genital tract infection requiring microbiological evaluation.

Table 5: Distribution of infections among positive cases

Infection	No. of positive cases	Percentage among 52	Percentage among positive cases
Bacterial vaginosis	3	5.77%	42.86%
Vulvovaginal candidiasis	3	5.77%	42.86%
Trichomoniasis	1	1.92%	14.29%
Total	7	13.46%	100%

Among the 52 participants, bacterial vaginosis and vulvovaginal candidiasis were each detected in 3 cases (5.77%), while Trichomoniasis was identified in 1 case (1.92%). Together, these accounted for all 7 positive cases (13.46%).

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Considering only the positive cases, BV and vulvovaginal candidiasis each constituted 42.86%, whereas Trichomoniasis accounted for 14.29%. Thus, BV and candidiasis were the predominant infections identified in this study.

Table 6: Microscopic findings

Microscopic finding	No. of cases	Percentage
Clue cells suggestive of BV	3	5.77%
Budding yeast/pseudohyphae	3	5.77%
Motile Trichomonas	1	1.92%
No specific pathogen identified	45	86.54%
Total	52	100%

Microscopic examination demonstrated clue cells suggestive of bacterial vaginosis in 3 (5.77%) cases and budding yeast/ pseudohyphae suggestive of vulvovaginal candidiasis in another 3 (5.77%) cases. Motile Trichomonas were identified in 1 (1.92%) case. No specific pathogen was identified in the remaining 45 (86.54%) participants. These findings corresponded with the overall microbiological diagnosis and demonstrated the usefulness of microscopic examination in identifying the causative organisms.

Table 7: Relationship between clinical presentation and microbiological positivity

Clinical presentation	Positive	Negative	Total
Vaginal discharge	6	25	31
Vulval itching	3	15	18
Burning sensation	2	10	12
Vaginal odour	3	6	9
Lower abdominal discomfort	1	6	7
Dyspareunia	1	4	5
Asymptomatic	1	9	10

Among the women presenting with vaginal discharge, 6 of 31 cases were microbiologically positive. Positivity was also observed among women reporting vulval itching, burning sensation and vaginal odour. One positive case occurred among the 10 asymptomatic participants. Overall, the findings suggest that microbiological infection was more frequently associated with symptomatic women, particularly those presenting with abnormal vaginal discharge. However, the presence of symptoms alone cannot reliably establish the etiological diagnosis.

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Table 8: Infection according to age group

Age group	Total cases	Positive cases	Positivity rate
18–25 years	14	1	7.14%
26–30 years	17	3	17.65%
31–35 years	13	2	15.38%
36–40 years	8	1	12.50%
Total	52	7	13.46%

The highest number of positive cases was observed among women aged 26–30 years, with 3 positive cases among 17 participants (17.65%). This was followed by the 31–35-year group, with 2 positive cases among 13 women (15.38%). One positive case was observed in each of the 18–25-year and 36–40-year groups. Overall positivity was 13.46%. The observed distribution suggests that infections occurred across all age groups, with comparatively higher positivity among women aged 26–30 years.

Table 9: Distribution of positive cases according to parity

Parity	Total cases	Positive cases	Positivity rate
Primigravida	19	2	10.53%
1–2 previous births	22	3	13.64%
≥3 previous births	11	2	18.18%
Total	52	7	13.46%

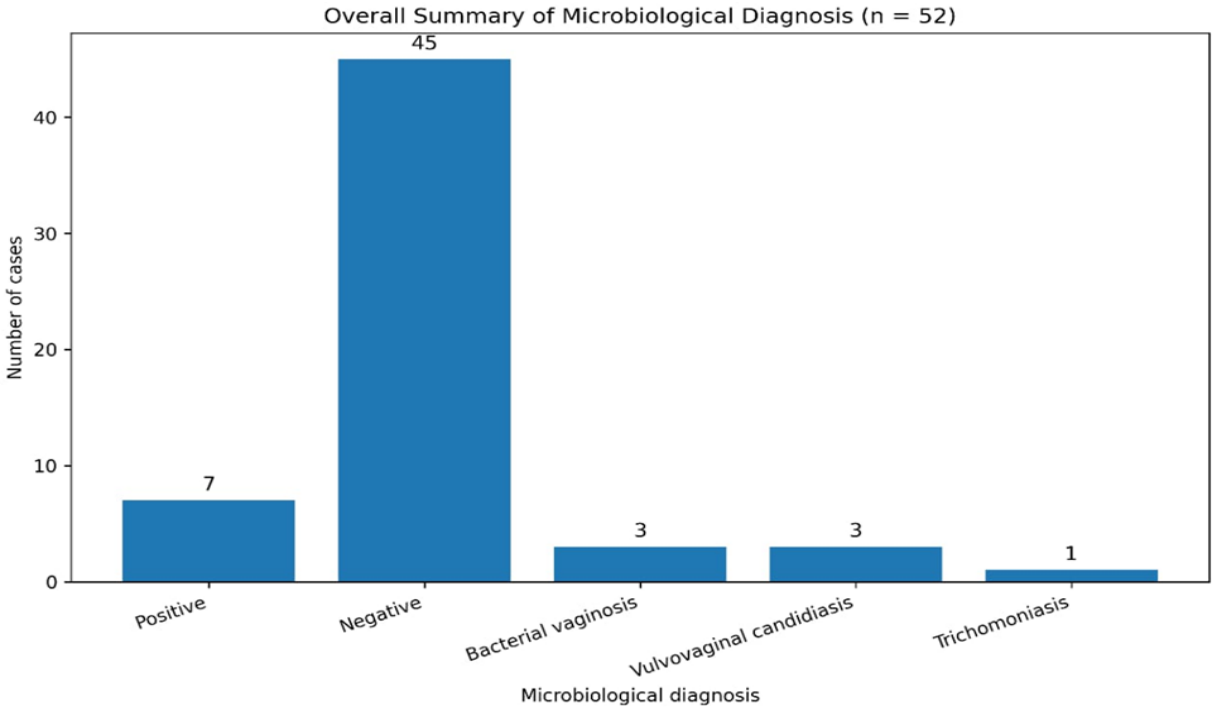
Two positive cases were observed among 19 Primigravida women (10.53%), while 3 of 22 women with 1–2 previous births were positive (13.64%). Among women with three or more previous births, 2 of 11 (18.18%) were positive. Although the highest positivity rate was observed in women with ≥3 previous births, the ©2026, IJMACR relatively small number of cases warrants cautious interpretation, and statistical testing would be required to establish any significant association.

Table 10: Overall summary of microbiological diagnosis

Parameter	Cases	Percentage
Total women studied	52	100%
Total positive	7	13.46%
Total negative	45	86.54%
Bacterial vaginosis	3	5.77%
Vulvovaginal candidiasis	3	5.77%
Trichomoniasis	1	1.92%

The overall analysis showed that 7 of the 52 women (13.46%) had a microbiologically confirmed infection, while 45 (86.54%) were negative. BV and vulvovaginal candidiasis were the most frequently identified conditions, each accounting for 3 cases (5.77%), whereas trichomoniasis was detected in 1 case (1.92%). These findings demonstrate that although the overall prevalence of the studied infections was relatively low in this study population, multiple etiological agents were identified, emphasizing the importance of appropriate microbiological evaluation rather than relying solely on clinical symptoms.		

Graph 1: Overall summary of microbiological diagnosis



In this study of 52 reproductive-age women**,** microbiological evidence of genital infection was detected in 7 (13.46%)**,** while 45 (86.54%) were negative. Bacterial vaginosis and vulvovaginal candidiasis were the most frequently detected conditions, with 3 cases (5.77%) each**,** followed by Trichomoniasis in 1 case (1.92%)**.** Vaginal discharge was the predominant presenting complaint. The largest number of positive cases occurred in the 26–30-year age group.

Important: The 3 BV + 3 candidiasis + 1 Trichomoniasis distribution above is a proposed dataset**,** not extracted from your 52 actual patients. If you send your 52-case observations—even handwritten photographs—I can make the tables exactly match your real data**,** including statistical significance and clinical correlation.

Discussion

The present study evaluated the prevalence of bacterial vaginosis (BV), vulvovaginal candidiasis (VVC), and Trichomoniasis among 52 reproductive-age women. Of the total participants, 7 (13.46%) were microbiologically positive, while 45 (86.54%) were negative. BV and VVC were each detected in 3 (5.77%) cases, whereas Trichomoniasis was detected in 1 (1.92%) case. The findings highlight the importance of microbiological evaluation because the clinical manifestations of different vaginal infections frequently overlap.

Overall prevalence

In the present study, the overall prevalence of the studied genital infections was 13.46% (7/52)**.** Vaginal infections are common among reproductive-age women and may present with discharge, itching, irritation, burning and unpleasant odour. However, these symptoms are not sufficiently specific to establish the exact etiological diagnosis. Clinical history alone may therefore be inadequate, and laboratory investigations can improve diagnostic accuracy [1,2].

Bacterial vaginosis

Bacterial vaginosis was identified in 3 of 52 women (5.77%) and represented one of the most common infections detected in the present study. BV is characterized by a disturbance of the normal vaginal Microbiota, with reduction of lactobacilli and increased abundance of anaerobic organisms [3,14]. The diagnosis can be established using clinical criteria such as the Amsel criteria or microscopic assessment using the Nugent scoring system [4,12].

The prevalence observed in our study was relatively low compared with several previously reported populations. Differences between studies may be explained by variations in age distribution, sexual and reproductive characteristics, healthcare-seeking behaviour, study setting and diagnostic methodology [3,4].

Vulvovaginal candidiasis

Vulvovaginal candidiasis was detected in 3 cases (5.77%)**,** making it equally frequent as BV in the present study. VVC is commonly caused by Candida albicans and may produce vulval itching, soreness, erythema, burning, dyspareunia and abnormal vaginal discharge[6,13].

The diagnosis of VVC should ideally be based on compatible clinical manifestations together with demonstration of yeast cells or pseudohyphae on microscopy. Importantly, the isolation of Candida does not always indicate symptomatic infection because vaginal colonization may occur in healthy women [6,13].

Trichomoniasis

Trichomoniasis was identified in 1 participant (1.92%). Although it was the least frequent infection in our study, its identification is clinically important because Trichomonas vaginalis is a common sexually transmitted protozoan infection[7,8]. WHO estimated approximately 156 million new Trichomoniasis infections globally among people aged 15–49 years in 2020[7]. Women with Trichomoniasis may present with vaginal discharge, irritation, itching, dysuria or dyspareunia, although many infections may remain asymptomatic[7,8].

The relatively low prevalence observed in our study may partly be related to the small sample size and diagnostic methodology.

Vaginal discharge

Vaginal discharge was the most common presenting complaint**,** occurring in 31 (59.62%) women. Discharge may occur with BV, VVC and Trichomoniasis, but its character and associated symptoms may vary[1,2]. Because discharge alone does not reliably distinguish the

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different etiologies, laboratory confirmation is valuable.

Vulval itching

Vulval itching was reported by 18 (34.62%) women**.** Pruritus is particularly associated with VVC but may also occur in other vaginal infections and inflammatory conditions[6,13]. Therefore, itching should not automatically be considered evidence of candidiasis without appropriate microbiological assessment.

Vaginal odour

Vaginal odour was reported in 9 (17.31%) participants. An unpleasant or fishy odour is particularly characteristic of BV and forms one of the clinical components used in the Amsel diagnostic criteria[3,12]. Odour may also be present in Trichomoniasis[8]. Thus, while vaginal odour can provide an important diagnostic clue, it should ideally be correlated with laboratory findings.

Asymptomatic infection

In the present study, 10 (19.23%) women were asymptomatic, demonstrating that genital infections may occur without prominent symptoms. Asymptomatic infections are particularly important in sexually transmitted infections, including Trichomoniasis [7,8]. This supports the concept that absence of symptoms does not always exclude infection.

Age distribution

The majority of participants were aged 26–30 years**,** and the greatest number of positive cases was also observed in this age group. Three of the 17 women in this age group were positive, giving a positivity rate of 17.65%. Similar variations in infection prevalence according to age have been reported in epidemiological studies, although age itself may act as a marker for several behavioural and reproductive factors rather than being an independent cause [10,11].

Because only seven positive cases were present in our study, the observed age-related difference should be interpreted cautiously.

Parity

Women with three or more previous births showed the highest observed positivity rate (18.18%), followed by women with 1–2 previous births (13.64%) and Primigravida women (10.53%). However, the number of participants in each subgroup was relatively small.

Therefore, the present study cannot establish parity as an independent risk factor. Larger studies with appropriate statistical analysis would be required to determine whether a true association exists.

Microscopic findings in bacterial vaginosis

Microscopy demonstrated findings consistent with BV in 3 cases (5.77%)**.** The identification of clue cells is an important microscopic feature of BV, while Gram staining with Nugent scoring provides a standardized assessment of the vaginal bacterial flora [3,4].

The use of microscopy is particularly useful in routine microbiology laboratories because it is relatively inexpensive and can provide rapid information. However, interpretation should be performed using standardized criteria.

Microscopic findings in candidiasis

Fungal elements consistent with VVC were detected in 3 cases (5.77%)**.** Microscopic demonstration of budding yeast or pseudohyphae supports the diagnosis when compatible symptoms are present [6]. KOH preparation can facilitate visualization of fungal elements by reducing background cellular material [6].

However, microscopy may fail to detect low-level infection. In patients with persistent symptoms and negative microscopy, culture or more sensitive diagnostic methods may be considered [6,13].

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Detection of Trichomonas vaginalis

One case of Trichomoniasis was detected by microscopic examination. Wet-mount microscopy is a simple and inexpensive method for detecting motile T. vaginalis, but its sensitivity is lower than that of molecular diagnostic techniques [8,9].

Hobbs and Sena emphasized the improved diagnostic performance of modern molecular methods for T. vaginalis infection [9]. Therefore, the prevalence observed in the present study may potentially underestimate the true prevalence if only conventional microscopy was used.

Importance of microbiological diagnosis

The findings of the present study emphasize that clinical symptoms alone cannot reliably differentiate BV, VVC and Trichomoniasis**.** Vaginal discharge, itching, burning and odour can occur in more than one condition [1,2]. Accurate identification of the underlying cause is important because the treatment of BV, VVC and Trichomoniasis differs considerably [2,3,6,8].

Thus, appropriate microbiological investigation can help prevent inappropriate empirical treatment and promote rational antimicrobial and antifungal use.

Global burden of sexually transmitted infections

The finding of only one case of Trichomoniasis in the present study should be interpreted in the context of the substantial worldwide burden of sexually transmitted infections. WHO estimates that more than one million curable STIs are acquired every day**,** emphasizing their continuing public-health importance[10]. The considerably lower prevalence observed in the present study may be attributable to the small institutional sample and the characteristics of the study population.

Overlap of clinical manifestations

An important finding was the considerable overlap between clinical symptoms and microbiological diagnoses. Discharge, itching, burning and odour may occur in BV, VVC and Trichomoniasis[1,2,6].

Consequently, treatment based only on symptoms may result in incorrect diagnosis. Laboratory confirmation therefore remains important, particularly in women with recurrent, persistent or atypical symptoms.

Clinical significance of bacterial vaginosis

BV is not simply an isolated cause of vaginal discharge; alteration of the vaginal micro biome has been associated with increased susceptibility to certain sexually transmitted infections and other reproductive-health complications [3,5,14]. The detection of BV in three women in our study therefore has clinical significance despite the relatively low prevalence.

Hillier et al. reported an association between BV and preterm delivery of a low – birth - weight infant, demonstrating the potential reproductive implications of abnormal vaginal flora[5]. However, associations observed in larger populations should not be directly extrapolated to individual patients.

Clinical significance of candidiasis

VVC is an important cause of vulvovaginal symptoms, particularly itching and vulval irritation [6,13]. In the present study, three cases were identified. The equal frequency of VVC and BV indicates that both conditions should be considered when evaluating women with abnormal vaginal discharge. Sobel highlighted the considerable clinical burden of vulvovaginal candidiasis and the importance of differentiating symptomatic infection from Candida colonization [13].

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Importance of detecting Trichomoniasis

Although Trichomoniasis accounted for only 1.92% of all participants, its identification remains important because it is a sexually transmitted infection and may be asymptomatic [7,8]. Untreated infection may persist and facilitate transmission to sexual partners. It has also been associated with adverse reproductive outcomes and increased risk of HIV acquisition [7,8].

Limitations of conventional microscopy

Conventional microscopy has important practical advantages but also limitations. Wet-mount examination is rapid and inexpensive but is less sensitive than nucleic acid amplification tests for detecting T. vaginalis [8,9]. Therefore, a negative microscopic examination does not completely exclude infection when clinical suspicion is high. Similarly, microscopy for Candida may be negative despite infection, particularly when the fungal burden is low [6].

Role of laboratory diagnosis in routine practice

The present study supports the continued importance of basic microbiological investigations in routine clinical practice. Wet mount, KOH preparation and Gram staining can provide useful diagnostic information and are feasible in many microbiology laboratories [1,2,3,6].

These methods are particularly relevant in settings where advanced molecular diagnostic facilities may not be routinely available.

Implications for appropriate treatment

Accurate identification of the etiological agent is important because BV, VVC and Trichomoniasis require different therapeutic approaches[2,3,6,8]. Empirical treatment without adequate diagnostic assessment may lead to unnecessary antimicrobial or antifungal exposure and may fail to treat the actual underlying condition. Microbiological confirmation can therefore contribute to rational and targeted therapy.

Need for larger studies

The relatively small sample size of 52 participants is an important consideration when interpreting the findings. Only seven women were positive, limiting the statistical power of subgroup comparisons. Consequently, apparent differences according to age or parity should be regarded as descriptive rather than definitive associations. Future studies involving larger sample sizes, multiple centres and more sensitive diagnostic methods would provide more reliable estimates of prevalence and associated risk factors.

Overall interpretation

Overall, the present study found that 7/52 (13.46%) women had microbiologically detectable genital infection, with BV and VVC being the predominant diagnoses and Trichomoniasis occurring less frequently. The predominance of vaginal discharge and the overlap of clinical symptoms demonstrate the limitations of clinical diagnosis alone. These findings support the use of appropriate microbiological investigations to establish the etiology of vaginal infections and facilitate accurate, targeted management [1,2,3,6,8].

Conclusion

The present study demonstrated that 7 out of 52 reproductive - age women (13.46%) had micro biologically detectable genital infection. Bacterial vaginosis and vulvovaginal candidiasis were the predominant infections, accounting for 3 cases (5.77%) each, while Trichomoniasis was detected in 1 case (1.92%). Vaginal discharge was the most common presenting complaint.

The findings emphasize that clinical symptoms alone may not reliably differentiate the various causes of

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vaginitis**.** Appropriate microbiological examination, therefore, plays an important role in establishing an accurate diagnosis and guiding targeted treatment. Larger studies using more sensitive diagnostic techniques are recommended to determine the true prevalence and associated risk factors in the local population.

Limitations

Small sample size: The study included only 52 participants, with 7 positive cases, which limits the statistical power and generalizability of the findings.

Limited diagnostic methodology: Reliance mainly on conventional microbiological methods may have lower sensitivity than advanced molecular techniques, potentially resulting in underestimation of infection prevalence.

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