Study on Bacterial Vaginosis in Reproductive-Age Women Using Contraceptives in A Tertiary Care Hospital

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Abstract

Background: Vaginal infection is acknowledged as a significant public health issue that affects women of reproductive age and results in a number of issues. The technique of contraception that is used increases the risk of genital infection. The most frequent cause of vaginal discharge in women of reproductive age is bacterial vaginosis. Although the typical vaginal flora differs from person to person, lactobacilli are often the dominant organism. There are other aerobic and anaerobic species in the bacterial flora. These are regarded as pathogenic in some cases. It is known that pelvic inflammatory illness, preterm premature rupture of the membranes (PROM), post-operative gynecologic infections, and abnormal Papanicolaou smear can all be indicators of bacterial vaginosis.

Aim: The goal of the current study was to estimate the prevalence of vaginal infections among women who used various forms of contraception. to determine the bacterial vaginosis prevalence. to discover the best accurate, affordable way to diagnose bacterial vaginosis.

Material and Method: The samples of vaginal discharge from women of reproductive age, or between the ages of 20 and 40, were collected and processed as part of the current study, which was a prospective study carried out in the Department of Microbiology. The research included 110 non-pregnant women with vaginal discharge as their primary complaint. All of the study's female participants gave informed permission, and the investigation received institutional ethical approval. Complete data on each patient's age, profession, place of residence, parity, and usage of contraception were gathered. This material also includes a history of odor, dysuria, dyspareunia, itching, and abnormal vaginal discharge. women who were bleeding during the collection of the specimens.

Results: Premenopausal women without children who were 20 to 40 years old and used a variety of contraceptive techniques were included in the current study. The study's female participants had an average age of 25.3 ± 2.2 years. Among these women, 126 (61.16%) had tubal ligations following their most recent pregnancies, used condoms, implanted IUCDs, and utilized no form of contraception at all. Both Amsel's and Nugent's Criteria were applied to all of these women in the current investigation. Amsel's Criteria revealed that of 110 non-pregnant women, 70 (65.04%) were positive for BV and 50 (34.95%) were negative (BV). Using Nugent's Criteria, however, revealed that 60 (49.51%) were BV-negative, 10 (8.7%) had BV-in-transition, and 40 (41.74%) had BV.

Conclusion: Using Amsel's and Nugent's criteria, the incidence of BV in non-pregnant, reproductive-age women with vaginal discharge was determined to be 60.04% and 40.74%, respectively. This demonstrates that the method of contraception used has an impact on the microbial flora in the vagina, which has significant ramifications for women who have diseases linked to changes in the vaginal ecology, such as BV. Therefore, it is advised that women who use contraception have routine microscopic tests.

Keywords: Prevalence, Infection, Bacterial Vaginosis, Intrauterine Contraceptive Device.

Introduction

The most frequent cause of vaginitis in women in the reproductive age range is bacterial vaginosis (BV). It is the illness that is seen the most frequently in a gynecological outpatient environment. In India, the frequency of bacterial vaginosis among adults varies from 17.8% to 63.7%.[1,2] Although the typical vaginal flora differs from person to person, lactobacilli are often the dominant organism. There are other aerobic and anaerobic species in the bacterial flora. Vaginal infections, vaginal skin conditions, and disruptions of the natural vaginal flora are all referred to as vaginosis and vaginitis, respectively. BV is a multi-microbial illness that causes complicated alterations to the normal vaginal flora.[3] It is known that pelvic inflammatory illness, preterm premature rupture of the membranes (PROM), spontaneous abortion, and post-operative infections can all be caused by bacterial vaginosis.[4,5] Healthy adult women of reproductive age have a mostly lactobacillus-based vaginal flora, which by maintaining an acidic pH hinders the growth of other organisms. Bacterial vaginosis (BV) is the most frequent vaginal infection in women of reproductive age.[6-7] The most popular method of contraception is the intrauterine contraceptive device (IUCD), which has the advantages of safety and affordability. One of the most popular and efficient reversible methods of contraception used around the world is the insertion of an IUCD. IUCD usage in the community is lower than anticipated, mostly because of worries about the possibility of side effects, notably Pelvic Inflammatory Disease (PID) and its aftereffects.[7] Both squamous and endocervical columnar cells are susceptible to inflammation and morphologic atypia brought on by contraceptives. The majority of them are benign alterations that are either degenerative or reparative.[8] These changes might have an impact on vaginal health and increase the risk of infections and symptoms including itchiness, discomfort, and unusual discharge. The natural vaginal flora, which contains anaerobic bacteria, typically overgrows, leading to bacterial vaginosis. Gardnerella vaginalis, Bacteroides, Mycoplasmahominis, and Mobil uncus spp. are among these anaerobic microbes. Gardnerella vaginalis is one of the most frequent BV agents.[9]

The symptoms of BV are caused by a synergistic interaction between all of these species. Despite being frequent, particularly in low-income areas, the illness is underdiagnosed.[10] Regular testing for bacterial vaginosis agents, notably Mycoplasma hominins, is important among pregnant teens in particular. In fact, given the 14% overall frequency of bacterial vaginosis in the third trimester, frequent screening of all pregnant women using cervicovaginal smears or wet mount is likely desired. Septic abortion is linked to the presence of anaerobes as well as an increase in the populations of Escherichia coli, Klebsiella aerogenes, and streptococcus faecalis. Similar to this, there are several bacterial vaginosis species linked to post-cesarean endometritis. Equally alarming is the apparent link between bacterial vaginosis microbes and infections of the amniotic fluid, chorioamnionitis, and early delivery.[11]Amsels composite criteria and agents grams stain examination of bacterial morphotypes, the two most extensively used techniques for bacterial vaginosis diagnosis, are not frequently used. The goal of the current study was to examine the prevalence of vaginal infections with different forms of contraception used by women of reproductive age. This study sought to evaluate the several frequently employed diagnostic techniques as well as track the prevalence of BV among women complaining of vaginitis and profuse vaginal discharge.[12,13]

Material and Methods

The samples of vaginal discharge from women of reproductive age, or between the ages of 20 and 40, were collected and processed as part of the current investigation, which was a prospective study carried out in the Department of Microbiology. The research included 110

non-pregnant women with vaginal discharge as their primary complaint. All of the study's female participants gave informed permission, and the investigation received institutional ethical approval. Complete data on each patient's age, profession, place of residence, parity, and usage of contraception were gathered. This material also includes a history of odor, dysuria, dyspareunia, itching, and abnormal vaginal discharge. Women who were bleeding vaginally at the time of specimen collection and those who had taken antibiotics for up to a month prior to sample collection for any bacterial, fungal, parasitic, or viral illness were excluded from the research. The doctor performed a thorough pelvic examination on women who had vaginal discharge while using a vaginal speculum. The discharge from the posterior fornix and lateral vaginal wall was collected using cotton-tipped swabs, which were then promptly taken to the microbiology lab.

The attending physician evaluated each patient. A thorough gynecological examination was conducted in addition to a general checkup. The patient was positioned in the lithotomy position for the latter procedure, and a sterile, non-lubricated speculum was inserted into the vagina. Clinical specimens were collected while the quantity, quality, and consistency of vaginal secretions were evaluated. A uniform form was used to capture the clinical data. Patients who visited the colposcopy clinic underwent a colposcopic examination as well as a standard cervical biopsy as part of a diagnostic assessment.

Inclusion criteria:
All the patients, clinically having the symptoms of vaginal discharge, were included in the study.

Exclusion criteria:
Patients in the menstrual period and patients who had taken antibiotics or received any treatment for vaginitis within the previous month were excluded from this study.

Vaginal Examination:
Amsel's Criteria, which include the existence of homogenous vaginal discharge, a pH of the vagina >4.5, the presence of clue cells, and a positive whiff's test, were then used to evaluate the vaginal discharge. According to Amsel's Criteria, the patient must have three out of the four requirements in order for BV to be justified. The pH of the vagina was measured using a pH paper strip (Merck pH indicator paper) with a range of 3.5–6.0. A uniform colorimetric reference chart was used to compare the color change. A drop of vaginal discharge was combined with a drop of 10% potassium hydroxide for the sniff test, which produces a fishy odor when the test is positive.[14]

Clue cell:
Vaginal epithelial cells that were entirely coated in Gram variable coccobacilli were deemed to be clue cells when the vaginal discharge was spread and stained with Gram stain. In conjunction with previous data, clue cells on a slide with at least 20 or more were considered to be a sign of BV. Gram-stained vaginal smears were assessed using Nugent's scoring for BV, which was divided into normal, intermediate, or BV groups with scores 0-3, 4-6, and 7-10, respectively, based on the kinds and quantity of bacteria per oil immersion field. The sample of vaginal discharge was also tested for the presence of trichomonas vaginalis and candidiasis by looking at budding yeast and, separately, the characteristic motility of trichomonads in a wet mount preparation. [15]

Statistical Analysis:
Where required patient data were analyzed using the Chi-square test with Yates' correction. The level of significance was set at 95% and recorded as p <0.05.

Result:
For the present study, premenopausal non-pregnant women of age group between 20 years to 40 years were included using various methods of contraception

Table 1: Prevalence of BV as Detected by Amsel's Criteria and Nugent's Criteria

	BV positive	BV negative	Transition
Amsel's Criteria	70 (65.04%)	50 (34.95%)	-
Nugent's Criteria	40 (41.74%)	60 (49.51%)	10 (8.7%)

The study's female participants had an average age of 25.3 ± 2.2 years. Among these women, 126 (61.16%) underwent tubal ligation after their most recent delivery, used a condom, implanted an IUCD, and utilized no form of contraception at all. Both Amsel's and Nugent's Criteria were applied to all of these women in the current investigation. Amsel's Criteria revealed that out of 110 non-pregnant women, 70 (65.04%) were positive for BV and 50 (34.95%) were negative. Using Nugent's Criteria, however, revealed that 60 (49.51%) were BV-negative, 10 (8.7%) had BV-in-transition, and 40 (41.74%) had BV.

Table 2: Comparison of Amsel's Positive and Nugent's Positive BV amongst Non-pregnant Women Using Different Methods of Contraception.

Method of contraception	Number	Amsel positive BV (%)	Nugent negative BV (%)
Tubal ligation	60	45 (73.01)	15 (47.61)
Condom	13	10 (44.44)	3 (22.22)
Copper T	12	8 (66.66)	4 (50)
No contraception	25	18 (52)	7(32)

In the current study, the positivity of BV among non-pregnant women using various forms of contraception was compared using Amsel's and Nugent's Criteria. In this study, out of all the patients, there were 70 patients with vulvovaginal candidiasis (VVC), 25 patients with trichomoniasis, and 15 patients with gonococcal infection.

Discussion
Among women who are fertile, BV is the most frequent reason for vaginal symptoms.[16] Contraceptive users have been found to have greater levels of BV positive than non-users in several investigations, and the results from these research were consistent and similar.[17-18] Every year, millions of women are affected with bacterial vaginosis (BV), an ecological disturbance of the vaginal microbiota that has been linked to a number of harmful health effects, including preterm delivery and the development of STDs. [19]

In the studies of Jogi et al.[20] and Levett et al.[21], 40.66% and 33%, respectively, were found. Studies by Lago et al.[7] and Shoubnikova et al.[22] and Shoubnikova et al.[22] showed lower prevalences of BV among IUD users—19.7% and 24.1%, respectively—which suggested lower prevalence than that seen in our study. The Josoef et al. study[18] found a correlation between BV and IUD use and hypothesized that women with both an IUD and BV may be more vulnerable to PID, especially if BV is present prior to implantation. Using Nugent's Criteria, the prevalence in this study was 41.74%, which indicated less than the studies by Bradshaw et al.[23], Chaijareenont et al.[24], and Sha et al.[25], indicating that the prevalence of

BV appears to fluctuate greatly from study to study. The findings of our study were consistent with those of studies by Bhalla et al.[26] and Verma et al.[27], which found a prevalence of BV of 29.2% among women who had vaginal discharge.

Pheifer et al. initially introduced Whiff's test in 1982[28]; it is sensitive and specific. If potassium hydroxide is added to the effluent and an ammoniacal odor is produced, the test is affirmative. The smell only briefly releases. Spiegel's and Nugent's criteria can also be used to make the diagnosis of bacterial vaginosis. Both of these standards are based on the analysis of the natural flora in the vaginal discharge Gram-stained smears.[3] When there is anaerobic vaginosis, Gram staining of vaginal discharge is very effective in determining the cause (more than 40 Gram-negative or Gram-variable coccobacilli per microscopic field at 1000 x magnification under oil immersion).[12]

Gram staining offers a clear view of bacterial morphologies and is thus unaffected by things like menstruation and recent sexual activity, which can change pH, as well as by technical aspects like how clue cells are interpreted by the viewer. It has been demonstrated that the vaginal gram stain has great intra and interobserver repeatability.[29] Amsel's criteria may be utilized for the diagnosis of BV at the OPD as it is straightforward, uncomplicated, affordable, quick, and reliable. The greatest challenge for the physician is the lack of access to direct microscopy.[30]

BV is a serious health issue that, if left untreated, can result in intermenstrual bleeding, delayed menstrual flow, chronic itching, foul-smelling discharge, and chronic lower back discomfort.[31] Numerous studies have noted strong correlations between the occurrence of bacterial vaginosis and a woman's reproductive age of >25 years.[32, 33] The presence of hormones like estrogens and progesterone in IUCD, which may increase the glycogen levels in the vaginal fluid and thereby promote the growth of candida species, may be the cause of the higher incidence of vaginal candidiasis seen in women of reproductive age in the current study. These findings are consistent with those of studies by Enweani et al. 2001[34] and Hurley et al. 1974[35].

Spiegel et aldefinition .'s of bacterial vaginosis in 1980[36] included precise criteria to categorize their patients. First, they were based on a wet smear examination showing no evidence of known pathogens such as I. vaginalis and/or yeasts, and then they were based on the presence of any two of the following: a) uniform vaginal discharges; b) discharge pH higher than 4,5; c) wet smear examination showing "clue" cells; d) release of "fishy" odor with the addition of 10% potassium hydroxide (KOH). G. vaginalis was isolated from all individuals who met these requirements.

It was established by Amsel et al.[37] that symptoms by themselves were not a reliable indicator of the existence of bacterial vaginosis. They discovered that 12% of their patients with bacterial vaginosis were aware of symptoms but did not report them, and 50% of them had no symptoms.
Alternative diagnostic techniques have been created, although they do not significantly outperform traditional techniques. Given these factors, techniques like Amsel and Nugent's score continue to be the most applicable, practical, and affordable choices for diagnosing bacterial vaginosis, particularly in poor nations.[12,38] The Nugent scoring technique is now the most used laboratory-based diagnostic tool for BV detection, and although though its inter- and intra-observer reliabilities have been called into doubt, it is still regarded as the gold standard.[39] Another problem is that the results depend on the microscope's field of

view.[40] Amsel's criteria for the diagnosis of BV were less sensitive than Nugent's score. However, using Amsel's criteria, 90% of BV-positive women may be identified appropriately.[41]

Conclusion:

Using Amsel's and Nugent's criteria, the incidence of BV in non-pregnant, reproductive-age women with vaginal discharge was determined to be 60.04% and 40.74%, respectively. This demonstrates that the method of contraception used has an impact on the microbial flora in the vagina, which has significant ramifications for women who have diseases linked to changes in the vaginal ecology, such as BV. Therefore, it is advised that women who use contraception have routine microscopic tests. Amsel's criteria for the diagnosis of bacterial vaginosis were equivalent to Nugent's criteria, and they are straightforward, simple, affordable, dependable, and may be utilized for accurate and quick treatment.

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