International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2020; 4(1): 404-406
Received: 05-11-2019
Accepted: 15-12-2019

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Study of the prevalance of bacterial vaginosis

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DOI: https://doi.org/10.33545/gynae.2020.v4.i1f.1123

Abstract
Bacterial vaginosis (BV) is a disorder of the vagina ecosystem characterized by a shift in the vaginal flora from the normally predominant Lactobacilli, to one dominated by a mixed flora. It is the most common reason for abnormal vaginal discharge in adult women. 90% cases of bacterial vaginosis are caused by Gram negative pleomorphic organism *Gardnerella vaginalis*. Bacterial vaginosis is known to cause various complications including preterm labour, PROM, PPROM in pregnant women. In non pregnant women, complications include PID, endometritis, postoperative infections and infertility.
The aim of this study was to study the prevalence of bacterial vaginosis in patients with white discharge attending gynaec OPD.

Keywords: Bacterial vaginosis, vagina ecosystem, mixed flora

Introduction
Vaginal discharge in the reproductive age group is the most common complaint encountered by Gynaecologists. White discharge per vagina is a broad term which encompasses both physiological and pathological discharge. The physiological WDPV is termed leucorrhea which denotes an increase in normal vaginal secretions and is non-infective. Leucorrhea is characterized by no increase in leucocyte count and the non-purulent character of the discharge both macroscopically and microscopically. An increase in normal vaginal secretion is seen at puberty, during pregnancy, at ovulation and in the premenstrual phase. The secretion contains proteins, polysaccharides, amino acids, enzymes and immunoglobulins [1].
Bacterial vaginosis (BV) is a disorder of the vagina ecosystem characterized by a shift in the vaginal flora from the normally predominant Lactobacilli, to one dominated by a mixed flora. It is the most common reason for abnormal vaginal discharge in adult women.
In this there is decrease in vaginal acidity and the normal lactobacillus predominant vaginal flora is replaced with anaerobic gram negative bacteria, *Gardnerella vaginalis*, Mycoplasma hominis and other bacteroides species. 90% cases of bacterial vaginosis are caused by Gram negative pleomorphic organism *Gardnerella vaginalis*.
Among the pregnant women bacterial vaginosis can cause preterm labor (PTL), both premature rupture of the membrane (PROM) and preterm PROM and concomitant infections including amnionitis, post partum endometritis and post caesarean wound infections.
Complications in non pregnant women include PID, endometritis, postoperative infections and infertility. The risk of acquiring HIV virus is also increased by the presence of BV infections.
Hence the study was undertaken to detect the prevalence of BV with discharge patient in a gynae OPD.

Aims and objectives
To study the prevalence of bacterial vaginosis in patients with white discharge attending gynaec OPD.

Material and methods
Source of data
The prospective study will be carried out in women visiting gynae opd with white discharge at MMIMSR, Mullana during the period May 2013 to June 2015.

Method of collection of data
Sample size: 500

Inclusion criteria: All women > 20 years of age with whitish discharge per vaginum.

Exclusion criteria

- Patients on treatment with antibiotics local and systemic.
- Patients not willing to participate in the study.
- Patients who are pregnant.
- Patients with bleeding per vaginum.

Vaginal fluid was collected from the posterior fornix with three cotton swabs. Speculum was introduced into vagina without lubricating with antibacterial agent containing cream.
First swab: pH determination by pH paper method.
Second swab: preparation of slide for Gram staining and Whiff test.
Third swab: wet mount preparation to look for T vaginalis, Clue & Yeast cells.

Clinical evaluation
A detailed history was taken regarding age, parity, medical history, history of vaginal symptoms like vaginal discharge, malodour, obstetric history of previous preterm deliveries and abortions. Baseline parameters like pulse, BP, temperature was recorded.

Other investigations done
Hb%, Urine routine, RBS, VDRL, HIV, HBsAg.

Diagnostic methods
Amsel's criteria
1. Appearance of vaginal discharge

A homogeneous, thin vaginal fluid that adheres to the vaginal wall was taken as diagnostic of bacterial vaginosis.

2. Vaginal fluid
Sample was obtained from the lateral vaginal wall or posterior fornix with the help of swabs to avoid contact with cervical mucus or blood. Just after collection on a sterile cotton swab it was touched onto the pH paper and the colour change was compared against the corresponding chart. Normal vaginal pH is 3.8-4.5. A pH >4.5 was considered as increased vaginal pH.

3. Clue cell
A swab containing vaginal fluid was collected and immediately placed into 1 ml of saline and mixed thoroughly. A drop of this was placed on a clean glass slide with the help of dropper and covered with a cover slip and observed under low power and high power objective and observe for the presence of clue cell. Presence of vaginal epithelial cell with borders obscured with adherent small bacteria was called a clue cell. Yeast cell and Trichomonas were also appreciated if present in the preparation.

4. Whiff test
On the collected vaginal swab two drop of 10% KOH was put and immediately sniffed. Test was interpreted as positive if a fishy aroma was noted.

Diagnostic criteria
If any of the above three of the four criteria were positive it was considered as bacterial vaginosis.

Gram stain diagnosis
Bacterial vaginosis is characterized by a shift from predominance of *Latobacillus morphotypes* to predominance of coccobacillary *Morphotypes* and Gram negative rods.

Results

Table 1: Distribution of WDPV Cases According to Age Group

Age Group	Prevalance
21-30	192(38.4%)
31-40	172(34.4%)
41-50	101(20.2%)
51-60	26 (5.2%)
>60	9(1.8%)

Table 2: Prevalence of Bacterial Vaginosis

Sample Size	Bacterial Vaginosis Positive	Bacterial Vaginosis Negative
500	131(26.2%)	369(73.8%)

Table 3: Type of discharge

Type of discharge	Number (%)
Homogenous grey	175
Greenish	65
Curdy white	35
Others	225

Table 4: Coinfections with Bacterial Vaginosis

Organisms	BV+	BV-	Total
Candidia	8	45	53
Trichomoniasis	18	58	76

Out of 131 positive cases 33 (25.1%) had all the 4 parameters positive (according to Amsels criteria) while clue cells were negative in only 4 cases.
Sensitivity of pH = 90% Specificity of pH = 68% Positive predictive Value of pH = 50%Negative Predictive Value of pH = 95%.
Sensitivity of Whiff test = 73% Specificity of Whiff test = 89%Positive predictive Value of Whiff test = 70.5% Negative Predictive Value of Whiff test = 90%.
Sensitivity of clue cells = 97% Specificity of clue cells = 85 Positive predictive Value of clue cells = 70% Negative Predictive Value of clue cells = 98.7% Sensitivity of homogenous white discharge = 65% Specificity of homogenous white discharge = 75.6% Positive predictive Value of homogenous white discharge = 48.5% Negative Predictive Value of homogenous white discharge = 86%.

Discussion
Bacterial vaginosis is a polymicrobial syndrome involving replacement of normal vaginal hydrogen peroxide producing lactobacilli by a variety of microorganisms. It increases the risk of upper genital tract infection and severe consequences to fertility and outcome of pregnancy thus necessitating its diagnosis.
In our study comprising of 500 cases of WDPV, 131 cases (26.2%) had BV as diagnosed by Amsel's criteria which was in concordance with the study by Modak *et al.* [3] and Rao *et al.* [4] which showed a prevalence of 24% and 20.5% respectively. It is also in concordance with studies by Allsworth *et al.* Rahman S *et al.* [5], Rekha *et al.* [6] and Al Quaiz [7] who have quoted a prevalence rate of 29%, 23.25%, 24% and 28% respectively.
The prevalence of Trichomonas vaginalis infection were 15.2% in our study which is in contrast to studies by Rekha *et al.* [6], Al Quiaz *et al.* [7] who quoted a prevalence rate of 3%, 4% and 8.5% respectively.
10.6% of all patients had candidiasis in our study which is in

agreement with studies by Rekha *et al*. and Al Quaiz who cited a prevalence of 11% and 12% respectively.

Infection with Trichomonas is usually associated with Bacterial vaginosis. It is understood that Trichomonas infection alters the vaginal ecology and facilitates the development of BV. In our study 23% of cases with Trichomonas also had BV in comparison of 2.8% cases in a study in Delhi which also showed 16.9% BV coinfection with Candida albicans in accordance to 15% in our study.

On comparison of the individual characteristics of Amsel's criteria clue cells were most sensitive (97%) while homogenous white discharge was the least (65%). Whiff test was the most specific test (89%) while pH test was the least specific (68%).Whiff test also had the highest positive predictive value (70.5%) while clue cells had the highest negative predictive value (98.7%).

In a study by Modak *et al*. [3] in Kolkata Whiff test had the highest positive predictive value which is in agreement with our results but Whiff test cannot be used as a single diagnostic test as it is less sensitive.

With pH more than or equal to 4.5 BV was the most common cause of WDPV in our study in concordance with study done by Begum *et al*. [8] which denotes the loss of lactobacilli, resulting in the rise in pH and massive overgrowth of vaginal anaerobes occur.

Clue cells seemed to be the best indicator of BV if both sensitivity and specificity were taken into consideration which is in contrast to study by Modak *et al*. which found pH to be most sensitive and specific.

Conclusion

500 patients with white discharge per vaginum attending the out patients department at the Obstretrics and Gynaecology, MMIMSR, Mullana were included in the present study.

The study was undertaken to find out the prevalence of bacterial vaginosis in patients with white discharge per vaginum using the Amsel's criteria for diagnosis. Clinical method using Amsel's criteria in combination with Gram stain is a simple, inexpensive and easily reproducible method for diagnosis and can be used even in a peripheral center where laboratory facilities are few.

Amongst the Amsel's criteria presence of clue cells was the most sensitive (97%) criteria with the highest negative predictive value. The present study was limited by the fact that the study was conducted in a rural setup with most of the patients belonging to low socioeconomic class and that the clinical features suggestive of PID were not followed by diagnostic tests as they were beyond the scope of this study.

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