



Bacterial Vaginosis Prevalence: Is It Really Common?

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Abstract

Introduction: Bacterial vaginosis (BV) represents the most common infection among women of reproductive age, with a prevalence rate of 23%. It develops when multiple microorganisms infect the vagina and decreases the colonization of the lactobacilli in the vaginal mucosal epithelium.

Objective: This research is done with the aim to evaluate the prevalence of the bacterial vaginosis in our study population.

Material and methods: The patient information was gathered retrospectively from the hospital's database covering the period from September 1, 2023, to August 31, 2024. The data was then entered in the SPSS version 30. T test was applied to the quantitative and chi-square test was applied to the qualitative data respectively.

Results: A total of 1645 vaginal swabs were analyzed from symptomatic patients. Out of which full blown BV with Nugent score of 7 and above was found in 11.9%(n=196) of the patients , while 67.78% (n= 1115) of the patients had altered vaginal flora. In 32.2%(n=530) of the patients, Bacterial Vaginosis (BV) was not found as the Nugent score was less than 3.. BV was most common in the reproductive age group, especially in the patients below 38 years.

It was found that 92.64% (n=1033) of the patients who have altered Nugent score belong to the age group between 18-38 years and 84.18% of the patients with the full-blown BV were also found to belong the same age group., The p-Value of 0.001 showed that the relationship is significant. The patients with the parity of 2-3 are more prone to have abnormal Nugent score, however the p-Value of 0.273 suggests that the relationship is not significant. Only 18.0% (n=252) of the patients were pregnant out of which 74.6%(n=188) have abnormal Nugent score, which makes 11.4% of the total study population. The total number of the patients who were found pregnant were 252 and out of which 28.17%(n=71) were discovered to have BV. The total number of the positive swabs were 196 (n=196) out of which 36.22% (n=71) were found to be pregnant. The p-value of 0.001 indicates the significance of the results.

Conclusion: BV was detected in 11.9% in the symptomatic patients, while 67.7% of the patients had altered vaginal flora depicted by the intermediate Nugent score.

BV is more common in the reproductive age group and in pregnant patients however no significant relationship was found with the parity.

We recommend routine BV screening for all symptomatic patients in reproductive age group. A prospective study with larger sample size is recommended to explore associated risk factors and outcomes.

Key words: *vaginitis, bacterial vaginosis, normal vaginal flora, Nugent score, pregnancy, vaginal microbiota.*

Introduction

Bacterial vaginosis (BV) represents the most prevalent infection encountered among females of reproductive age; its prevalence rate ranges from 6% to 32% globally.¹ This condition is identified as a vaginal dysbiosis marked by a reduction in lactic acid-producing lactobacilli and an increase in the proliferation of both facultative and strict anaerobic microorganisms.² The onset of BV occurs when multiple microorganisms invade the vaginal environment, resulting in a diminished colonization of lactobacilli within the vaginal mucosal epithelium. These microorganisms encompass gram-negative bacteria such as *Prevotella* species, *Mobiluncus* species, *Gardnerella vaginalis*, *Mycoplasma hominis*, *Bacteroides* species, *Peptostreptococcus*, *Fusobacterium* species, *Atopobium vaginae*, and *Ureaplasma*.³

As soon as the female child is born the vaginal wall get colonised and remain colonized until death.⁴ Rather the colonization will start during the birth process, the organisms are transferred from the mothers vagina and flourishes in the infants vagina as a result of the residual maternal estrogen levels.⁵ As soon as the child reaches puberty the cyclical changes in the circulating levels of the estrogen hormone begin with increased base line levels of the hormone at puberty.⁶ This increase in estrogen levels leads the proliferation of the vaginal epithelium and in the mid cycle, peak of the intracellular glycogen levels is seen in the vaginal mucosal cells and as a result the increase in number of the lactic acid producing micobes are found.⁷ The lactobacilli respond to the increase glycogen metabolism and as a result high amount of lactic acid is produced and the vaginal PH is dropped to 4.0- 4.5, this PH seems to be responsible for the inhibition of the colonization of the virulent bacterial species.⁸

The presence of the lactobacilli in the vaginal flora is responsible for maintaining a healthy vaginal environment, so much so that the Nugent score which is used to diagnose bacterial vaginosis is based on the quantification of the lactobacilli present in the vaginal smear.⁹

In healthy women the vaginal flora is a finely tuned ecosystem which is subjected to a constant change. It has been recognized now that the spectrum of microbial profiles can produce a stable vaginal ecosystem which can be disrupted by hormonal levels, choice of the contraception, sexual activity and hygiene practices.¹⁰ Cherpes included cigarrate smoking, stress conditions, black ethnicity, high use of vaginal douches, early age of intercourse in the list.¹¹ Use of the specific hygiene products as per Newton also play a part.¹² During the different stages of the womens reproductive life the fluctuating levels of the hormones which regulate the mensyrual cycle have significant influence on the vaginal flora.⁷

Globally prevalence of BV is 23-33% in Europe and north America respectively and is considered as the most common infection in women of reproductive age having bad odor discharge.¹³ Its assumed that the patients having intermediate score are not yet infective but in reality the majority of the women having score called intermediate, manifest a more serious range of the complications including mid-trimester pregnancy loss, than the 'classic' full-blown BV.¹⁴

Candida species leading to VV is the second most common infection after BV which is affecting the genital tract of millions of the females worldwide. It is characterized by the cheesy vaginal discharge associated itching and burning sensation.¹⁵

The studies have recognised BV as a risk factor for various obstetric complications. These complications include preterm labour and delivery,¹⁶⁻¹⁸ premature rupture of the membranes and low birth weight,¹⁹ and spontaneous abortion.²⁰ It can also increase the risk of post partum infection such as endometritis,²¹ and caesarean section wound infection.²² The evidence of all these possibilities of the complications in pregnant and non pregnant women justifies to do the testing of the bacterial vaginosis in any women presenting with the vaginal discharge.

The diagnosis of BV relies on the clinical criteria (Amsel's Criteria) or microbiological assessment (Nugent score) the Nugent score, based on Gram- Stained vaginal smears, is considered the gold standard for the BV diagnosis and we have used this in the current study.

Given the variability in BV prevalence across different populations, this study aims to evaluate the incidence of the BV among symptomatic women attending a tertiary care hospital in Riyadh.

Material and Methods

We have collected the data retrospectively form the database of the hospital from first September 2023 till 31 August 2024.

The data was then entered in the SPSS version 30. T test was applied to the quantitative and chi-square test

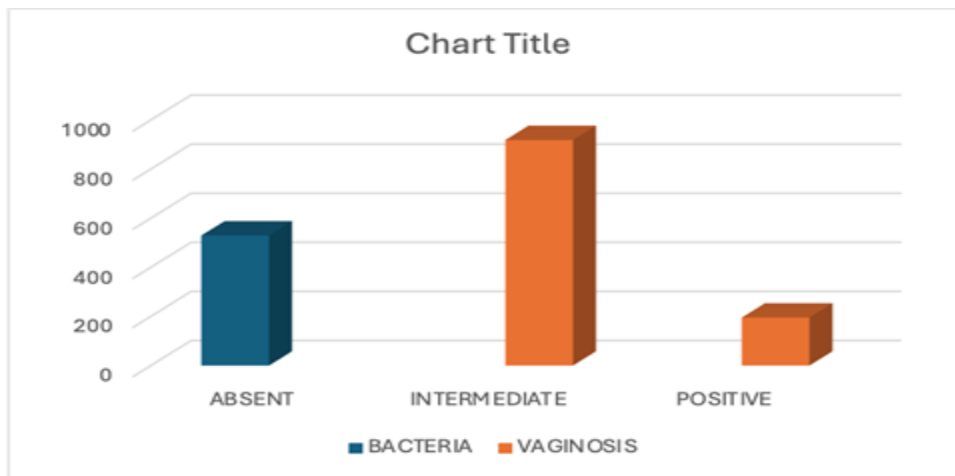
was applied to the qualitative data respectively.

In the study under discussion, we have diagnosed BV by using the Nugent's criterion which is considered as the gold standard for the diagnosis of bacterial vaginosis (BV), Composite Nugent score was categorized into three categories, scores 0–3 being normal, 4–6 being intermediate, and 7–10 being definite bacterial vaginosis.(Chawal et at, 2013) .

Results

The total number of the swabs taken for the bacterial vaginosis in symptomatic patients were 1645. Out of which 67.78% (n= 1115) of the patients had altered vaginal flora while in 32.2%(n=530) of the patients, Bacterial Vaginosis (BV) was not found as the Nugent score was less than 3. Full blown BV with Nugent score of 7 and above was found in 11.9%(n=196) of the patients, as shown in the graph 1below.

GRAPH:1 OVER ALL SWAB RESULT



The rate of the bacterial vaginosis with the Nugent score is shown below in table 1.

TABLE 1: PREVALENCE OF THE BACTERIAL VAGINOSIS

	ABSENT	INTERMEDIATE	POSITIVE	TOTAL
BACTERIA VAGINOSIS	32.2% (n=530)	55.8% (n=919)	11.9% (n=196)	1645
NUGENT SCORE	0-3	4-6	7-10	

BV was found more common in the reproductive age group, especially in the patients below 38 years, as shown in the Table below. The mean age was found to be 28 years.

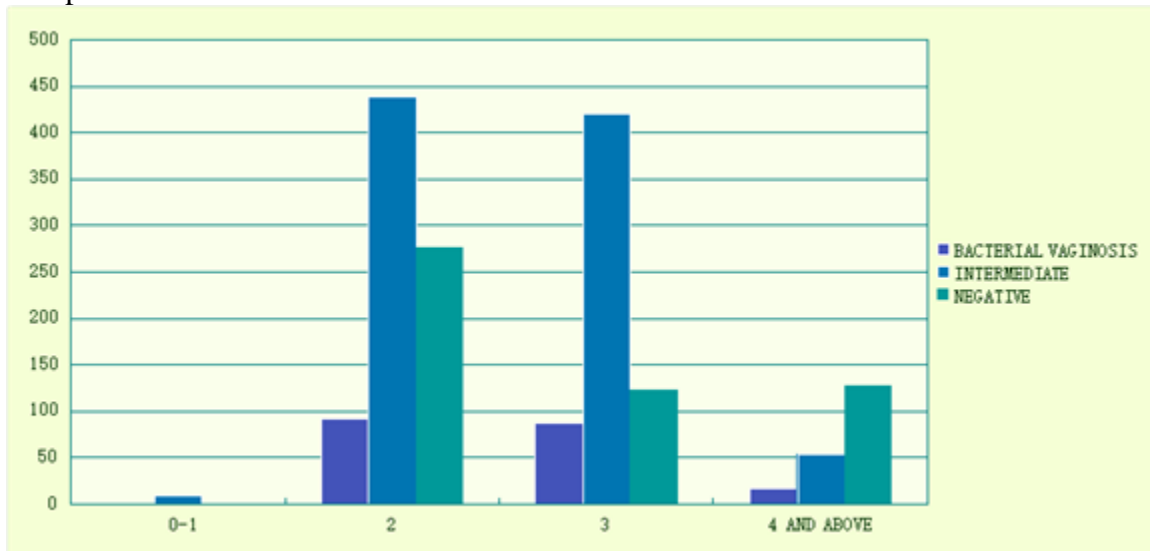
It was found that 92.64% (n=1033) of the patients who have altered Nugent score belong to the age group between 18-38 years and 84.18% (50+115,n=165)of the patients with the full-blown BV were also found to belong the same age group.The p-Value of 0.001 shows that the relationship is significant.

TABLE 2: RELATIONSHIP OF THE AGE WITH BV AND THE NUGENT SCORE

AGE IN YEARS	18-28	28.1-38.	38.1-48	48 AND ABOVE	TOTAL
Bacterial Vaginosis (Nugent Score 7-10)	6.04% (n=50)	16.88% (n=115)	24.19% (n=30)	07.69% (n=01)	11.91% (n=196)
Intermediate (Nugent Score 4-6)	53.8% (n=445)	62.11% (n=423)	40.32% (n=50)	15.38% (n=02)	55.92% (n=920)
Negative (Nugent Score 0-3)	40.1% (n=332)	20.99% (n=143)	35.48% (n=44)	76.92%(n=10)	32.09% (n=528)
Total	100% (n=827)	100% (n=681)	100% (n=124)	100% (n=13)	100% (n=1645)

The patients who are para 2-3 are more prone to have abnormal Nugent score, however the p-Value of 0.273 suggests that the relationship is not significant, as shown in graph below.

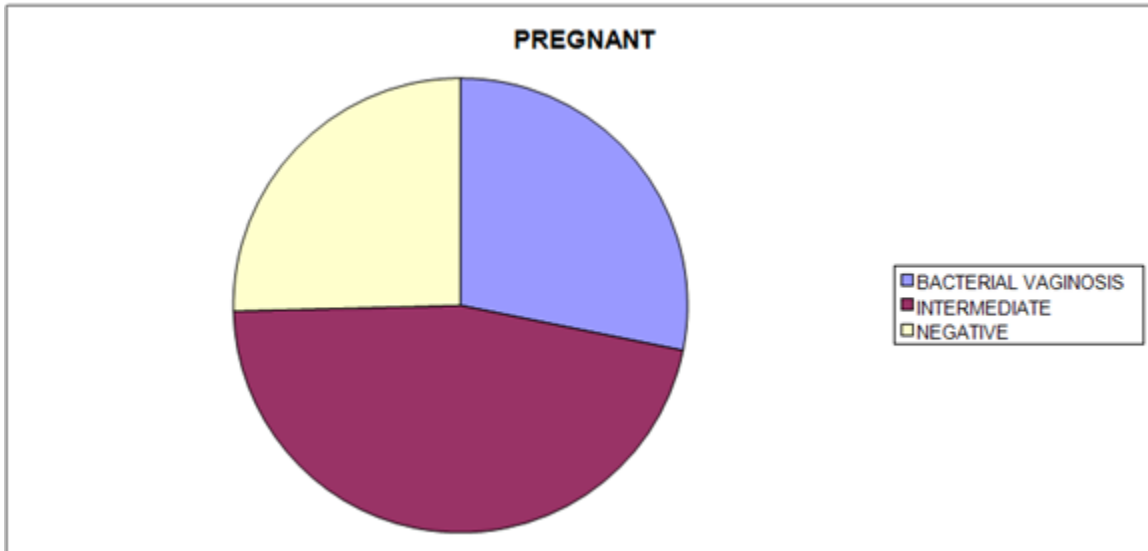
Graph 2 :RELATIONSHIP OF THE PARITY WITH BV AND THE NUGENT SCORE



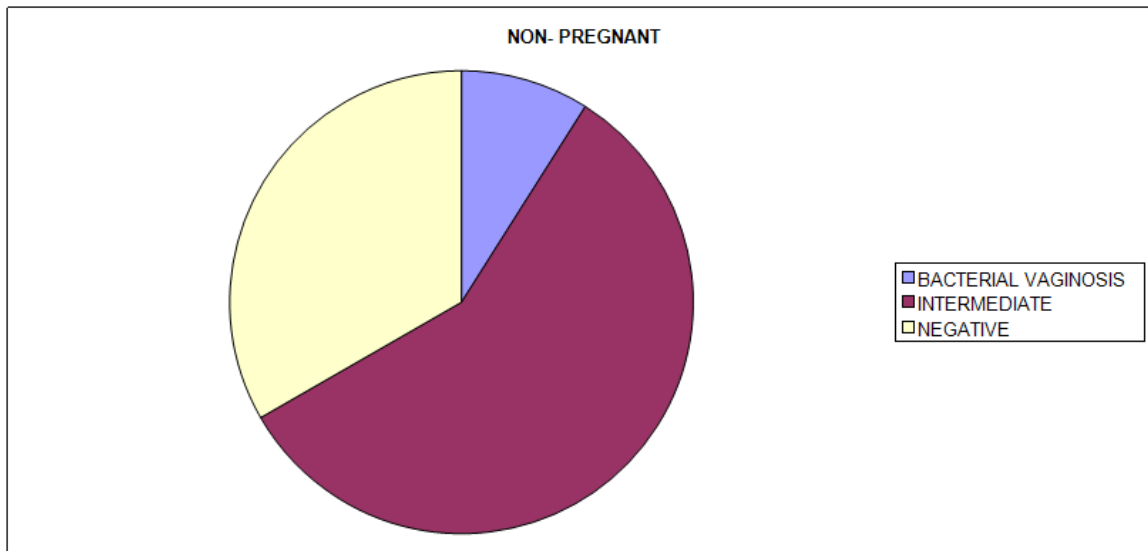
Only 18.0% (n=252) of the patients were pregnant out of which 74.6%(n=188) have abnormal Nugent score, which makes 11.4% of the total study population. The total number of the patients who were found pregnant

were 252 and out of which 28.17% (n=71) were discovered to have BV, out of total number of the positive swabs (n=196) 36.22% (n=71) were found to be pregnant. The p-value of 0.001 after applying the chi-square the p-value of 0.001 indicates the significance of the results, as shown in graph. 3a and 3b below.

GRAPH 3a: RELATIONSHIP OF BACTERIAL VAGINOSIS WITH PREGNANCY



GRAPH 3b:



Discussion

The rate of bacterial vaginosis which we found was 11.9 % which is within the range of 6%-32% ¹ however it is less than 23% which was reported by Zuckerman. ³ In India the prevalence rate was 24% , ²³ while in Egypt it was found to be highest i.e. 33% reported by Gad et al. ²⁴ in some populations the incidence is more

than 50%.²⁵ BV is common in low social economic groups where the reported incidence is 20-49%. Its reported rate is 45-55% in African American, 20-30% in Asian women and 5-15% in Caucasian women.²⁶ Kesah in her study found the incidence of 24% which was also higher than the results found in the current study under discussion.²⁷

In the current study the rate of BV in pregnant population was 28.17%. which is higher than what found by Kamga who found it to be 26%.²⁸ in contrary to our findings the prevalence was reported to be 10.1% by Ng et al²⁹ and 11.5% by purwar et al.³⁰ among 1006 pregnant women and they have also used the Nugent's score for the doagnosis. Larsson et al in their study cohort of 9025 pregnant women found the prevalence of BV in 9.3% of casses only.³¹

Svare et al in Universiy Hospital Denmark found itto be 16% in the pregnant cohort of 30540 patients which is also lower than what we found in the current study.³²

It was found to be 24.3% by Laxmi et al in their pregnant cohort of the patients which is also slightly less than what we found.³³ While it was detected in 49.8% of the pregnant patients in Sudan.³⁴ which is much higher than what we detected. Similarly in Ghana³⁵ its prevalence was 30.9%, in Nigeria it was reported to be 38%³⁶. Kurewa detected the prevalence of 32.6 % in Zimbabwe.³⁷

However in Tanzania the prevalence of the BV in pregnant patients was found to be similar to out study i.e 28.5%.³⁸ The differences in prevalence of the bacterial vaginosis suggests the involvement of the sexual and hygienic practices in different areas of the world.

This is the reason that early detection of the BV and its treatment is needed to prevent the complications related to the pregnancy. we have found that the 58.6% of the BV population belonged to age group between 28-38 years of age. Similar results were found by Sowmya et al who found highest prevalence in the age group of 26-30 years.³⁹ Vani et al also concluded that the prevalence was higher in age group 28-32 years.⁴⁰ Bitew et al also found highest prevalence in the age group 31-35 years.⁴¹ where as kamga et al²⁸ found it more common in the age group between 18-28years. Ranjit et al. reported the highest prevalence of BV in women 30–40 years but these were non-pregnant women.⁴²

Gray also found highest prevalence among women of 20-24 years.⁴³

Conclusion

The rate of BV was found to be 11.9% in the symptomatic patients, however 67.7% of the patients had altered vaginal flora depicted by the intermediate Nugent score.

Its more common in the reproductive age group and in pregnant patients however no significant relationship was found with the parity.

We recommend routine BV screening for all symptomatic patients in reproductive age group. A prospective study with larger sample size is recommended to explore associated risk factors and outcomes. Given the high rate of altered vaginal flora (67.8%), patients with the intermediate Nugent score should be closely monitored for progression to full blown BV.

Strengths:

This study represents the inaugural investigation within the department aimed at quantifying the prevalence of the BV, serving as a foundational benchmark and facilitating a subsequent examination after a period of two years or more, which may assist in ascertaining the fluctuations in the trend of the BV within our population cohort.

Limitations:

Our study population consisted exclusively of married individuals preventing comparison with unmarried or single patients. Additionally, as this was a retrospective study, it did not account for the effects of contraception, vaginal douching, antibiotic use or other potential influencing factors.

The impact of BV on pregnancy outcomes was not assessed neither the effects of treatment nor the recurrence was evaluated.

Financial disclosure: NA

Conflict of interest: NA

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