



## THE PREVALENCE OF ENDOGENOUS BACTERIAL VAGINOSIS IN OWERRI WEST LGA OF IMO STATE



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**Abstract:** Bacterial vaginosis is a global concern due to the risk associated with it, as it increases the risk of Human Immunodeficiency Virus, other sexually transmitted diseases and in Owerri West LGA, the situation report is scarce. The objectives of this study were to determine the prevalence of Bacterial vaginosis, and age-related prevalence among the Owerri West LGA women in order to sensitize, create awareness and suggest possible ways of interventions to avoid complications associated with it among them. The cross-sectional descriptive study design was adopted and two hundred and ninety-six (296) vaginal smears (swabs) from symptomatic and asymptomatic women ranging from 18-37 years were collected to determine the prevalence of Bacterial vaginosis among them using Amsel and Nugent criteria as well as with a view to establishing the age group mostly affected. Statistical analysis was based on simple percentages. Out of the 296 women screened for Bacterial vaginosis, 90 (30.4%) of them were infected using Amsel criteria while 89 (30.1%) were positive with Nugent criteria, confirming the reliability of the two diagnostic methods. The age related prevalence 37.1% (3-27) years was higher than the other age cohorts. The total prevalence rate of 30.4% demands urgent attention to prevent bacterial vaginosis associated complications and devastating effects on women's reproductive system and pregnancy. Women both symptomatic and asymptomatic should try and undergo Bacterial vaginosis screening to avoid complications, government through its organ should create more awareness among women folk while adequate laboratory facilities suitable for screening and testing should be provided. Moreover, well trained medical laboratory Scientists be employed to handle screening of special cases such as Bacterial vaginosis.

**Keywords:** Bacterial vaginosis, endogenous, age, women, Owerri west LGA

### Introduction

Endogenous infections are caused by the reactivation of organisms present in a dormant focus or by the overgrowth of organisms that can be present in the genital tract of apparently healthy women; old and young, such as bacterial vaginosis and vulvovaginal candidiasis (Meheus, 1992; Shulz *et al.*, 1992). Bacterial vaginosis was first described by Gardner and Duke (1995) and is seen primarily in sexually active women, characterized by a non-irritating malodorous vaginal discharge (Thomas, 1990; Amsel *et al.*, 1983). It is a global concern due to the risk of acquisition of sexually transmitted infections, and often reoccurs after treatment, with 50% of women having return of symptoms within 12 months (Bradshaw *et al.*, 2013). Formally, it is known as Gardnerella vaginitis, and is a common dysbiosis (also called dysbacteriosis) affecting about 21 million women in the United states (Koumans *et al.*, 2007; Bagnall *et al.*, 2017). Although, the prevalence of bacterial vaginosis differs widely from country to country within the same region and even within similar population groups, it has been estimated to be in the range of 8 to 75% (Murta *et al.*, 2005). For instance, it affects 8 – 23% of normal pregnant women in developed countries and about 25 - 50% of infected individuals may remain asymptomatic (O'Brien, 2008; Kraus-Silva *et al.*, 2014). In Nigeria, a prevalence on bacterial vaginosis on pregnant women in Maiduguri North-eastern Nigeria (Ibrahim *et al.*, 2014), had a prevalence of 17.3% and in Jos, Plateau state, Lar-Nadam *et al.* (2013) has a prevalence of 36.8%. Bosede *et al.* (2016), Olawuyi (2011), Awoniyi *et al.* (2015) had 26, 51.72, 33.3% in their various reports. Moreover, Lenox *et al.* (2013), Nyengidik and Goddy (2015) had 35.29 and 7.8%, respectively. While Obiora *et al.* (2018) revealed a prevalence of 23.9%. Wariso *et al.* (2017) reported a prevalence of 51% in Port Harcourt, Rivers state of Nigeria. Looking at the trend, Bacterial vaginosis can occur in any age group but globally, it is more prevalent in females of reproductive age (Lakshma *et al.*, 2013). Endogenous vaginal bacteria, such as bacterial vaginosis associated organisms are often involved in recurrent pevic inflammatory diseases (PID)

(Taylor *et al.*, 2013). In addition, reproductive tract infections that cause spontaneous abortions or stillbirth (Sobel and Sobel, 2015) and such infections have been reported in infants whose mothers had gonorrhoea, chlamydia or Bacterial vaginosis (Rush *et al.*, 1976). Organisms linked to Bacterial vaginosis have been significantly associated with premature rupture of membrane, preterm labor, amniotic fluid infection (Amsel *et al.*, 1983; CDC 1993; Martius *et al.*, 1988).

Bacterial vaginosis has also been described as a shift in the balance of the vaginal microflora characterized by an increase in the vaginal pH, a reduction in lactobacilli, predominantly hydrogen peroxide producing species, and an increase in facultative and anaerobic bacteria in number and type (Eschenbach *et al.*, 2000). And for many years, bacterial vaginosis has received little attention, since it is considered to be a trivial disease. However, it is a morbid disease in terms of loss of working days and treatment cost (Donders *et al.*, 2002). Furthermore, it increases the risk of acquiring human immunodeficiency virus (Myer *et al.*, 2005) and other sexually transmitted infections, such as gonorrhoea, trichomoniasis, and Herpes simplex virus type 2 (HSV-2) (Martin *et al.*, 1999; Cherpes *et al.*, 2003).

The diagnosis of bacterial vaginosis can be made using clinical criteria or laboratory criteria. It is diagnosed clinically by considering three Amsel criteria (Amsel *et al.*, 1983). Usually the laboratory diagnosis in addition to Amsel criteria is based on Gram staining of vaginal smear using Nugent scoring system (Nugent *et al.*, 1991) which is a gram stain scoring system for vaginal swabs to diagnose Bacterial vaginosis. Although, bacterial vaginosis is associated with numerous health problems and is a major global concern, it has been the focus of neither intensive study nor active control programs in Nigeria and to the best of my knowledge, such study or studies among women in Owerri West LGA, Imo state is rare. Therefore, this study was designed to determine the prevalence of Bacterial vaginosis among the Owerri west LGA women attending clinic at Cottage clinic Ohii, Owerri west LGA Imo state, Nigeria, to sensitize and create more

awareness of the infection and also suggest possible interventions to avoid Bacterial vaginosis associated complications.

**Materials and Method**

This study was conducted in Cottage clinic at Ohii, Owerri West LGA, Imo state Nigeria. The reason being that many of the female patients from Owerri West LGA attend the clinic for their numerous health problems, especially gynecological cases.

**Study design**

This is a descriptive cross-sectional study of Owerri West LGA women who presented to the clinic for Vaginal smear (swab) tests.

**Study population**

This is a study on the prevalence of bacterial vaginosis (BV) involving two hundred and ninety-six (296) Owerri West LGA women who attended Cottage clinic Ohii, Owerri West LGA, Imo state.

**Determination of sample size**

A suitable sample size of two hundred and ninety-six (296) women ranging from 18 to 37 years old were determined using the formula:

$$N = \frac{Z^2 P (1 - P)}{d^2}$$

This is according to Naing *et al.* (2006) based on prevalence of 26% reported among pregnant women in Lagos (Bosede *et al.*, 2016).

Z = 1.96 (statistic for a level of confidence (95%)  
P = 26% (population based); d = 5% (precision or margin error); n = Sample size.

$$n = \frac{(1.96)^2 \times 0.26 (1 - 0.26)}{0.0025} \times 295.649 = 296$$

**Exclusion criteria:** Women who are menstruating and those who declined.

**Consent and ethical approval:** Permission to study was obtained from the Medical Director (MD) of the clinic while verbal consent was also obtained from the participants after explaining the purpose and what they stand to gain.

**Statistical analysis**

This was based on simple percentages among the age groups.

**Collection of samples**

A total of two hundred and ninety-six (296) vaginal smears (swabs) were collected from the women as they reported to the clinic with the aid of sterile swab sticks according to Wariso *et al.* (2017); Ochei and Kolhatkar (2008) and Chessbrough (2011) after the procedure was explained and consent obtained from each participating woman. The samples collected were properly labelled and moved to Galaxy Diagnostic laboratory where the analysis was done.

**Analysis:** This was done according to Amsel *et al.* (1983) and Nugent scoring system (Nugent *et al.*, 1991).

**Results and Discussion**

Table 1 shows the overall prevalence of the total population studied and the prevalences of the two groups of women (symptomatic and asymptomatic) involved. The overall prevalence of bacterial vaginosis among the women is 30.4% while symptomatic women have a prevalence of 38.3% of Bacterial vaginosis, the asymptomatic has 15.0%.

Table 2 shows the prevalence of Bacterial vaginosis among the various age groups studied. The infection was higher (37.1%) among the age group of 23-27 years than in the other

age cohorts; 28-32 years has 30.0% while 33-37 years had 25.0% and 18-22 years, 22.0%.

**Table 1: Prevalence of bacterial vaginosis among Owerri west LGA women**

| Groups       | Number screened/ Tested | Bacterial vaginosis(%) |
|--------------|-------------------------|------------------------|
| Symptomatic  | 196                     | 75 (38.3)              |
| Asymptomatic | 100                     | 15 (15.0)              |
| Total        | 296                     | 90 (30.4)              |

**Table 2: The prevalence of bacterial vaginosis (BV) in relation to age groups**

| Age(Years) | No.Examined | No. Positive | Frequency (%) |
|------------|-------------|--------------|---------------|
| 18-22      | 41          | 9            | 22.0          |
| 23-27      | 105         | 39           | 37.1          |
| 28-32      | 90          | 27           | 30.0          |
| 33-37      | 60          | 15           | 25.0          |
| Total      | 296         | 90           | 30.4          |

**Table 3: Prevalence of bacterial vaginosis among Owerri west LGA women based on Amsel/Nugent criteria**

| Parameters      | Positive | Freq. (%) | Negative | Freq. (%) |
|-----------------|----------|-----------|----------|-----------|
| Amsel criteria  | 90       | 30.4      | 206      | 69.6      |
| Nugent criteria | 89       | 30.1      | 207      | 69.9      |

Table 3 compares the results obtained using Amsel criteria and that of Nugent scoring system. While result from Amsel criteria is 30.4% positive (prevalence) that of Nugent scoring system gives a positive of 30.1% prevalence among the women studied.

Bacterial vaginosis is a global concern due to the risk of acquisition of sexually transmitted infection which often recurs after treatment and remains an infection that has very serious consequences in the reproductive systems of women. In this cross-sectional descriptive study, the overall prevalence rate of 30.4% (Table 1) among the women studied should be a matter of concern and it poses a threat to the health of the women ,especially those still bearing children. This isolation rate (30.4%) agrees with the works of Lar-Nadam *et al.* (2013); Awoniyi *et al.* (2015); Lenox *et at.* (2013) and Abudu and Odugbeni (1985) who variously reported 36.8, 33.3, 35.29 and 30.0% prevalences in similar studies across Nigeria. It is however, lower than Olawuy (2011) who revealed 51.72% in Urban women in Nigeria and Wariso *et al.* (2017) who got 51.0% in Port harcourt River state among patients with vulvovaginitis in a tertiary hospital in Port harcourt. Adane *et al.* (2017) equally reported a prevalence of 48.6% in a prevalence study “Bacterial vaginosis and associated risk factors among women complaining of genital tract infection”. Nevertheless, Ibrahim *et al.* (2014), Bosede *et al.* (2016), Ngengidik and Goddy (2015) and Obiora *et al.* (2018) variously got 17.3, 26, 7.8 and 23.9% in their respective reports.

The pattern of spread of bacterial vaginosis among the women of Owerri west LGA in Imo state of Nigeria by age is as shown in table 2. The age groups mostly affected are those of 23 - 27 years and 28 - 32 years and this agrees with the report of Wariso *et al.* (2017) who reported highest among 26 - 30 years cohort. The results also, corroborates the fact that this infection is primarily in sexually active women characterized by a non-irritating malodorous vaginal discharge (Thomas, 1990; Amsel *et al.*, 1983) and supports Lakshmi *et al.* (2013)

who commented that bacterial vaginosis is more prevalent in females of reproductive age.

Moreover, the infection rate among the group of women involved in this study is shown in (Table 1). The symptomatic women has the prevalence of 38.3% of Bacterial vaginosis while the asymptomatic has prevalent rate of 15.0%. This study confirms the existence of Bacterial vaginosis even in the asymptomatic and it is in consonance with the revelation of Konji *et al.* (1991) who got 9.0% among asymptomatic controls in Ibadan, moreso, in line with the statement by O'Brien (2008) and Kraus-Silver *et al.* (2014) that even in developed countries, 25 – 50% of infected individuals may remain asymptomatic.

The possible explanation for the variations in the various reports, and the outcome of this study when compared with other works may be attributed to category of personnels and laboratory facilities involved in the screening or testing exercise, improvement in the health services, treatment of women with metronidazole (Morales, 1994; Hallen *et al.*, 1987), self-consciousness and much preached protected sexual intercourse.

Previous works have shown that the trend of bacterial vaginosis rate in the past varied from work to work, and the prevalent rate (30.4%) of this investigation in Owerri Local Government Area has shown that urgent action be taken than maintaining ignorance of this particular infection in the Local Government Area.

In conclusion, the total prevalence rate of 30.4% demands urgent attention to prevent bacterial vaginosis associated complications and devastating effects on women's reproductive system and pregnancy. Moreso, this study has confirmed the reliability of the two diagnostic methods, showing that if laboratory equipment is not available for diagnosis of bacterial vaginosis, Amsel's criteria can be as good as Nugent scoring system at diagnosing the infection.

The study therefore, recommend that women, both symptomatic and asymptomatic should undergo screening to know their status and avoid unnecessary complications, moreover, more awareness should be created among women folk while adequate laboratory facilities be provided. In addition, well trained Medical laboratory Scientists be employed to handle special cases such as bacterial vaginosis investigations. It is hoped that the result of this study will help in the management of women with the infection in the state, especially pregnant and those presenting with profuse vaginal discharge .

#### Conflict of Interest

No conflict of interest.

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