

Bacterial Vaginoses caused by *Gardnerella vaginalis* at Thiès Regional Hospital: Study of Clinic-Biological Aspects

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ABSTRACT

Introduction: Bacterial vaginosis is a frequent infection among women. The aim of this study is to make an evaluation of the prevalence of infections caused by *Gardnerella vaginalis* among women who underwent vaginal tests in the laboratory of Biology of Thiès Regional hospital... Our study intends to elucidate and define the characteristics of vaginal exudate in this condition, but also to evaluate the diagnostic criteria in force at the laboratory level.

Materials and Methods: It is about a retro-prospective study over two years between July 31st 2017 and July 31st 2019 among women from whom vaginal samples were taken.

Our study population concerned all female outpatients or hospitalized consultants at the Regional hospital of Thiès during the study period. The secretions are collected at the level of the vaginal walls or at the level of the posterior fornix with a sterile swab, trying to bring back as much secretion as possible. Macroscopic and microscopic examinations and the identification of the germs involved were carried out.

Results: Out of a total of 2376 vaginal samples, we observed a frequency of 25.5% of vaginosis caused by *Gardnerella vaginalis*. 70.72% presented with white-haired leucorrhoea, 35.69% presented with fetid leucorrhoea. Very rare leukocytes were found in 74.34% and 24.51% with cervicitis associated with vaginosis.

Conclusion: Vaginosis caused by *Gardnerella vaginalis* is a frequent condition especially among women of childbearing age. It can lead to severe gynecological and obstetric complications. For better management, strengthening laboratory diagnosis is necessary.

Keywords

Bacterial vaginosis, *Gardnerella vaginalis*, Vaginal swab.

Introduction

Bacterial vaginosis is a very common infection in women, it is the most common form of genital infections. It results from

the modification of the vaginal flora with the replacement or association of lactobacilli by commensal bacteria such as *Gardnerella vaginalis*, from *Mycoplasmas*, anaerobic bacteria like *Mobiluncus spp*, *bacteroides spp*). The causes of the abnormal multiplication of these microorganisms are not all known [1]. The chief agent responsible is *Gardnerella vaginalis*, a commensal

bacterium of the vaginal lining of women. Under certain conditions, this bacterium proliferates abnormally, imbalances the vaginal flora and becomes pathogenic [2]. Endogenous and exogenous risk factors can promote the appearance of bacterial vaginosis, namely hormonal, pathological, ethnic factors, stress, tobacco, certain drugs but also sexual intercourse. It is a generally benign pathology but which can lead to serious gynecological and obstetric complications. In France, the prevalence of bacterial vaginosis is estimated to be 15 to 20% [3]. Study in Nigeria found 40% of women had bacterial vaginosis [4]. In Morocco, Louzi L et al. found a prevalence of 16.1% [5]. Bacterial vaginosis is the second leading cause of vaginal infections (pathological leucorrhoea) in women during periods of childbearing [5]. According to studies, it is responsible for 16 to 29% of cases of prematurity, chorioamnionitis, spontaneous abortions, low birth weight [6]. In addition, this pathology has a significant psychological impact on women for whom bacterial vaginosis becomes chronic and recurrent. In Senegal, the study by Diagne R et al. showed a frequency of 21% on 5928 samples [7].

The aim of this work was to make a clinical biological study of infections due to *Gardnerella vaginalis* in women received for vaginal samples in the Biology laboratory of the Regional Hospital of Thiès. Our study intends to elucidate and define the characteristics of vaginal exudate in this condition, but also to identify rapid diagnostic criteria. This will allow a better interpretation of the cytobacteriological examination of vaginal secretions but also to show the place occupied by vaginosis in *Gardnerella vaginalis* in vaginal infections.

Equipment and methods

It is about a retro-prospective study over two years between July 31, 2017 and July 31, 2019 in women for whom a vaginal sample was taken.

Target population

Our study population concerned all female outpatients or hospitalized consultants in the Thiès Regional Hospital during the study period.

The patients selected for this study met the following criteria:

- Be admitted to the laboratory of the CHR of Thiès for a vaginal sample.
- To present *Gardnerella vaginalis* on microscopic examination of the smear from the vagina.
- To be admitted during the study period.

Sampling

The following pre-analytical conditions were required for the sample:

- Show up outside the rules,
- Do not wash the vagina on the day of the sample,
- Not be under local or general treatment (antibiotics, lubricants, antiseptics)
- Do not have sexual intercourse 24 hours before the sample

The secretions are collected at the level of the vaginal walls or at the level of the posterior fornix with a sterile swab, trying to bring back as much secretion as possible. Microscopic examinations and the identification of the germs involved are carried out on these samples taken.

Study of samples

Macroscopic examination assessed the color, appearance, consistency and odor of the secretions.

Microscopic examination of the vaginal sample after Gram stain revealed the replacement of lactobacilli by a mixed flora with the presence of small coryneform bacilli with a variable Gram *Gardnerella* or Gram-positive coccobacilli evoking *Atopobium vaginae*, or small Gram-negative bacilli evoking *Prevotella*, or curved Gram variable bacilli reminiscent of *Mobiluncus*.

Exploration by direct examination after Gram stain of vaginal secretions taken from the posterior or lateral fornix of the vagina made it possible to establish the type of flora divided into 4 groups:

Flora type 1: exclusive presence of Döderlein flora

Flora type 2: predominance of Döderlein flora, presence of another flora

Flora type 3: predominance of flora other than Döderlein

Flora type 4: absence of Döderlein flora

Results

We collected a total of 2376 vaginal samples from the Thiès Regional Hospital. We observed 608 cases of vaginosis *Gardnerella vaginalis* ie a frequency of 25.5%.

Distribution by odor of leucorrhoea

Patients with odorless leucorrhoea were in the majority with a percentage of 61.35% followed by 35.69% of women with fetid leucorrhoea. The following figure shows us the distribution of women according to the smell of leucorrhoea.

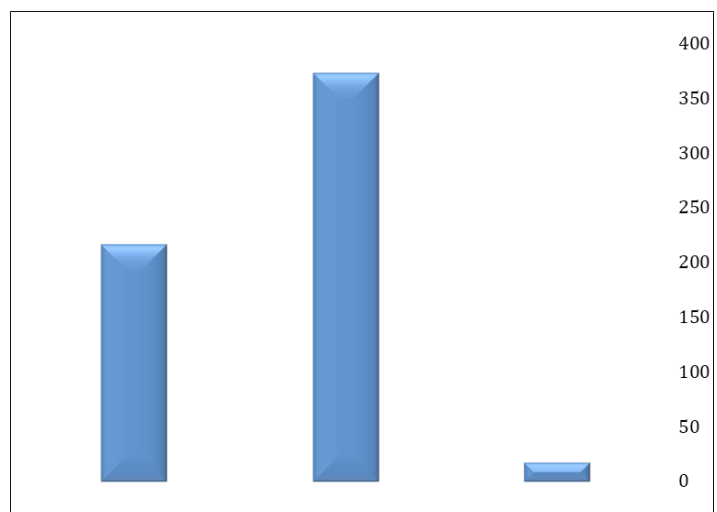
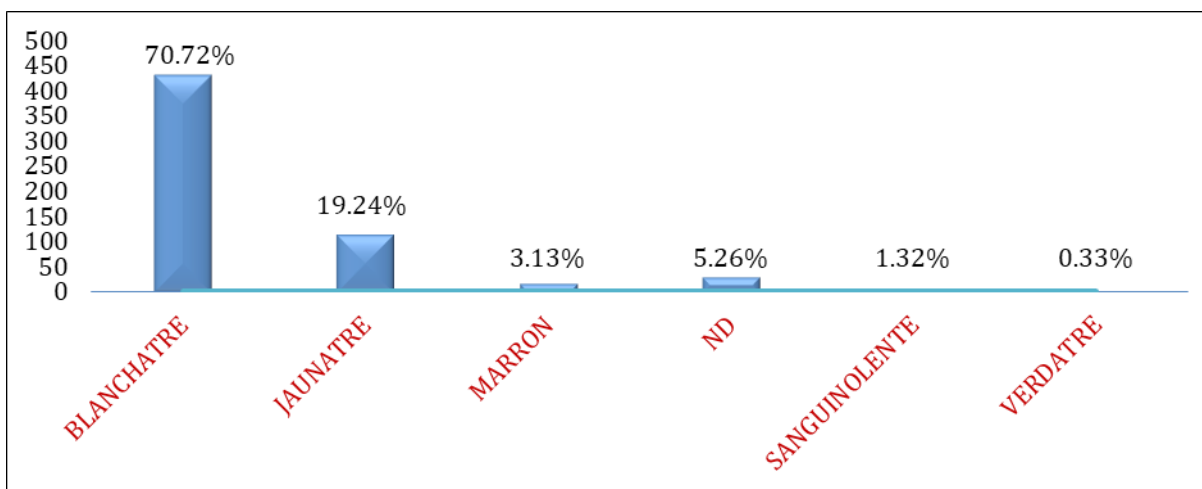
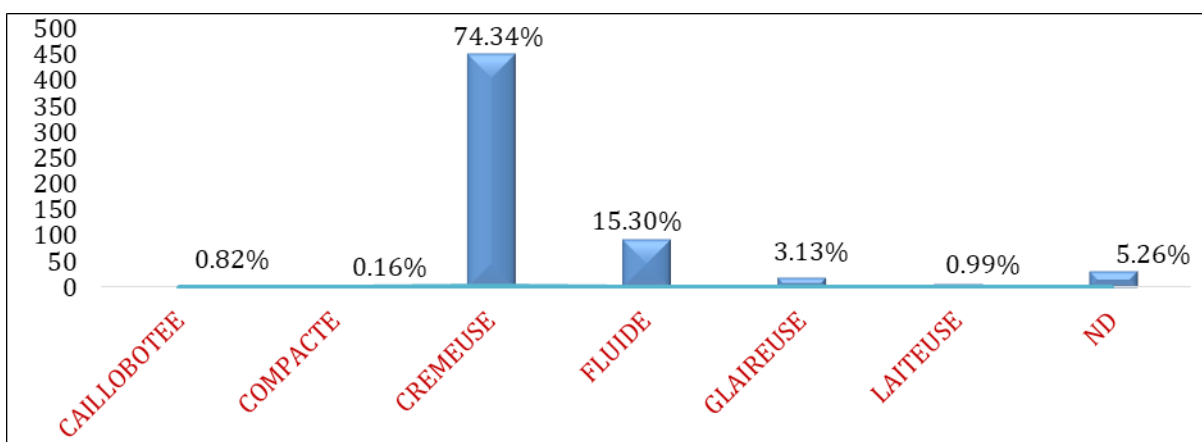


Figure 1: Distribution of patients according to the smell of leucorrhoea.



WHITISH YELLOWISH BROWN ND SANGUINOLENT GREENISH

Figure 2: Distribution of patients according to the color of the leucorrhoea.



CHEESE WHITE COMPACT CREAMY FLUID EGG WHITE MILKY NA

Figure 3: Distribution of patients according to the consistency of leucorrhoea.

Distribution by color of leucorrhoea

Patients with whitish leucorrhoea were largely in the majority with 430 cases (70.72%), followed by yellowish leucorrhoea. The ND represent women for whom we have not had data.

This figure below illustrates the distribution of patients according to the color of the leucorrhoea.

Distribution of patients according to the consistency of leucorrhoea

The following figure distinguishes women based on the consistency of leucorrhoea. Patients with creamy leucorrhoea were in the majority with a percentage of 74.34%, the 5.26% are those for whom the data were not available.

Distribution of patients according to the abundance of leucorrhoea

Leucorrhoea was in the majority of cases, abundant with 547 patients or 89.97%, followed by scanty leucorrhoea (8.39%). The following table breaks down the women according to the abundance of leucorrhoea.

Table 1: Distribution of patients according to the abundance of leucorrhoea.

Quantity of leucorrhoea	Number of patients	Percentage
Abundant	547	(1/8)
Little abundant	51	8 / 14
NA	10	1.64%
Grand total	608	100.00%

Distribution of patients according to the appearance of the uterine cervix

There were 149 women with cervicitis associated with bacterial vaginosis, or 24.51%. The following table breaks down the women according to whether the cervix is inflammatory or not.

Table 2: Distribution of patients according to the appearance of the uterine cervix.

Appearance of the cervix	Number of patients	Percentage
Inflames	149	10:51
ND	13	2.14 %
Normal	446	73.36%
Grand total	608	100.00%

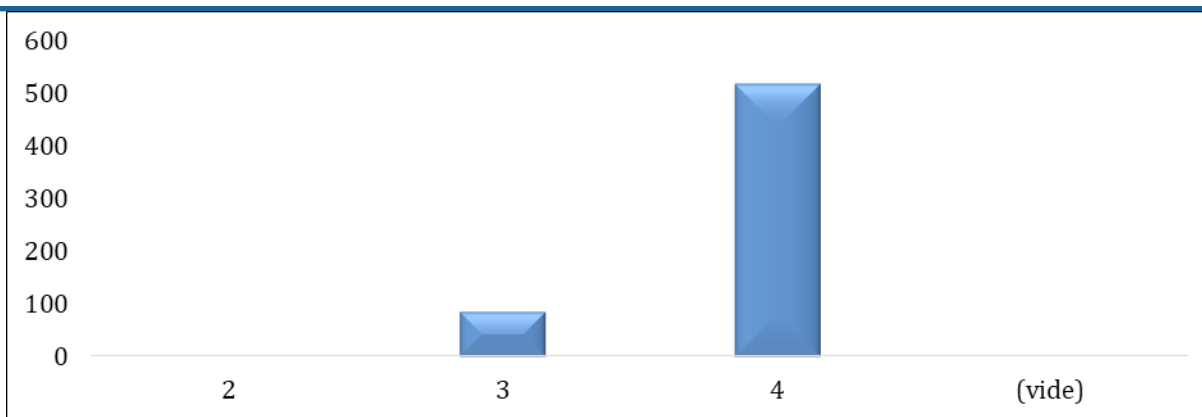


Figure 4: Distribution of patients according to the type of flora.

Distribution of patients according to functional signs

The signs frequently associated with bacterial vaginosis were leucorrhoea with 49.17%, respectively, followed by infertility of the couple with a percentage of 23.85%, pelvic pain with 15.29%, dysuria (9.7%) and vulvar pruritus 2%. Among these women only 3% had to complain of a foul odor of leucorrhoea.

- Microscopy results

Distribution of patients according to the presence of leukocytes

Most of the samples, ie more than 98%, show a rarity in the presence of leukocytes. The following table breaks down the patients according to the presence of leukocytes.

Table 3: Distribution of patients according to the presence of leukocytes.

Number of leukocytes	Number of patients	Percentage
0-9	594	98%
10-19	6	1%
20-29	2	0%
30 and more	6	98%
Grand total	608	100%

Distribution of patients according to the presence of red blood cells

During the microscopic examination 87 patients presented red blood cells in their leucorrhoea, ie 14.30%.

Distribution of patients according to the presence of yeasts

We recorded 167 patients who presented with yeast in leucorrhoea, ie 27.46%.

Distribution by type of flora

The majority types of vaginal flora were respectively type 4 with a rate of 84.87%, type 3 with a rate of 13.98%. The following figure illustrates the patients according to the type of flora.

Discussion

The signs frequently associated with bacterial vaginosis were respectively leucorrhoea with 49.17%, followed by infertility of the couple with a percentage of 23.85%, pelvic pain with 15.29%, dysuria (9.7%) and vulvar pruritus 2%. Among these women only 3% had to complain of fetid leucorrhoea. In the study by Calzolari et al. 215 women were asked about the symptoms

they had during BV among them 115 or 53% complained of leucorrhea, 2.5% of women complained of vulvar pruritus [8]. These results are similar to those of our study. Olusola et al. in their study in Nigeria reported a rate of 56.9% of women with dysuria, 68.3% dyspareunia, 62.5% pelvic pain and 18% vulvar pruritus [9]. The difference in the percentages between this study and ours could be explained by the fact that Olusola et al. had pre-established symptoms to look for, whereas in our study the absence of a pre-established questionnaire at the laboratory level meant that these were the symptoms. defined by the prescriber of the PV which were transcribed [9]. To this we can also add the missing data. Apart from leucorrhoea, the women had other signs that could be related to a probable infection associated with BV. The signs of irritation such as pruritus and dysuria should suggest a urinary tract infection and pelvic pain should suggest an upper genital infection because a study showed that 48.7% of women with BV had a urinary tract infection [10]. The women in the majority of cases had no physical signs. There was inflammation of the cervix in 149 women, or 24.51%. These results are different from those found by P. Koueke in his study where he found that 50% of women had an inflamed cervix. [11]. Calzolari and cervix found inflammation of the cervix and vagina in 2.8% of patients [8]. Linda M Morgos et al. in their study involving 210 women, 14 of the women had cervicitis or 14% of the women, among these 14 women 12 women or 87.5% of the women had bacterial vaginosis [12]. Intriguing evidence points to a link between cervicitis and bacterial vaginosis. Largest BV and Cervicitis Study by Schwebke et al. to date show that 15% of 423 women who had BV had coincident cervicitis and in most of these women (87%) no conventional pathogens were detected [13]. In a different study of women with both BV and cervicitis, the vaginal gel form of metronidazole was put as treatment on a standard regimen of doxycycline and ofloxacin. The results showed a high cure rate for cervicitis. These data suggest that certain bacteria associated with BV may contribute to the pathogenicity of cervicitis [14]. Patients with whitish leucorrhoea were largely in the majority with 430 cases (70.72%), followed by yellowish leucorrhoea. Leucorrhoea was abundant with 547 patients or 89.97%, followed by scanty leucorrhoea (8.39%), creamy leucorrhoea were in the majority with a percentage of 74.34%. Odorless leucorrhoea was the majority with a percentage of 61.35% followed by 35.69% of women

presenting with fetid leucorrhoea. Faye-Kette et al. in Abidjan found white-grayish leucorrhoea in 76.5% of cases, creamy in 63% of cases, abundant in 62% of cases, fetid in 86% of cases [15]. Olusola Peter et al. in Nigeria found whitish leucorrhoea in 6.6% of cases, yellowish in 86.6% of cases fetid in 85% of cases, odorless in 15% of cases, fluid in 81.6% of cases [9]. Our study is comparable to that of Faye-Kette because the percentages of whitish leucorrhoea 70.72% in our study against white-grayish leucorrhoea 76.5%, respectively abundant leucorrhoea were in the majority 89.97% against 62%. The other parameters and the study of Olusola Peter show us different results [9]. We can from these observations say that the diagnosis of bacterial vaginosis on the basis of the clinic (characteristics of leucorrhoea) alone has limits. The classic description of leucorrhoea in BV tells us about whitish or white-grayish leucorrhoea, homogeneous smelly with the smell of rotten fish [16]. Several factors, endogenous and / or exogenous, can modulate hypersecretion [17]. Other associated infections, douching can also change the characteristics of leucorrhoea. In our study, bacterial vaginosis was predominantly associated with a scarcity of leukocytes on the pap smear. Women carriers of *Gardnerella vaginalis* had low leukocyte counts. All these results are consistent with the data in the literature which show that bacterial vaginosis is a condition without noticeable leukocyte reaction [18]. However, the leukocytes present in the vaginal smears to a considerable extent can be explained by the existence of a concomitant infection. According to Lefèvre and Holmes, inflammatory signs are rare in bacterial vaginosis and may be related to an associated infection [19]. Another study showed that high vaginal leukocyte count in women with BV was a strong predictor of vaginal or cervical infections, which gives us the understanding that BV normally does not associate with a strong white blood cell reaction. In our study we noticed that the majority of women had type IV flora, in fact 84.87% of women positive for *Gardnerella vaginalis* had type IV flora and 13.98% of women had type III flora. These results allow us to highlight the indisputable link that there is between the imbalance of the vaginal flora and bacterial vaginosis. The latter is the fundamental element in the pathophysiology of bacterial vaginosis. A type IV flora is a flora poor in lactobacilli with a total absence of the Döderlein flora. This shows us that our results are in agreement with the literature [20].

Conclusion

Bacterial vaginosis is a frequent ailment.

Our study consisted of a laboratory evaluation of the diagnosis of vaginal infections with *Gardnerella vaginalis*. *The most important part of the diagnosis of this condition is a Gram-stained vaginal smear.*

The prevalence in our study is 25.5%.

The functional signs associated with bacterial vaginosis in our study were leucorrhoea with 49.17%, whitish in color and creamy in consistency.

Bacterial vaginosis was hardly associated with the presence of leukocytes.

This study allowed us to show that bacterial vaginosis occupies an important place in the causes of genitourinary infections. With a prevalence of 25.5%,

Bacterial vaginosis requires proper diagnosis and treatment not only because of the discomfort it causes, but also because of the complications to which it exposes.

In view of the high frequency of bacterial vaginosis in women, the bacteriologist must systematically include the search for vaginosis bacteria in the protocol for analyzing genital exudates. And it becomes necessary to check the sensitivity of these bacteria to the usual antibiotics in the event of recurrence.

In addition, it would be desirable to screen pregnant women at risk of abortion or prematurity and treat them if necessary. It would be very important to encourage further studies on the risk factors of this affection, on the risk behaviors of the women who expose them, and to detect the possible phenomena responsible for the recurrence encountered in this affection.

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