

# Gynecological complaints and their associated factors among women in a family health-care clinic

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## ABSTRACT

**Aim:** The aim of this study was to describe the most common gynecological complaints and possible associated factors among women of reproductive age attended at a family health-care clinic. **Methodology:** A transversal study conducted with a sample of an outpatient population consisting of women of reproductive age. Pregnant women and minors were excluded. The final sample consisted of women between 18 and 49 years of age. The participants answered a questionnaire in which the complaints of the last 4 weeks were registered. They were examined, had the vaginal pH assessed, and secretion was tested using a 10% potassium hydroxide solution to verify the presence of amine odor (whiff test). **Results:** Most participants were black or of mixed races. Considering the frequency of complaints, there were no significant differences between white and nonwhite women. There was an association between vaginal pH and discharge complaints as well as unpleasant odor, positive test of amines, smoking, and performing vaginal douches. **Conclusions:** Vaginal complaints were common among participants; the practice of vaginal douches was also frequent and was associated with higher pH values. The use of hormonal contraceptives was associated with lower pH values. There was no significant association between condom use and gynecological complaints, vaginal pH, or the whiff test.

**Keywords:** Female genitalia, vaginal discharge, vaginal diseases, vaginal douching

## Introduction

Gynecological complaints are frequent reasons for seeking primary health-care clinics. In addition to being annoying, they can compromise the sexual and reproductive health of women. Among the most common complaints are the abnormal vaginal discharge and pain in the lower abdomen. In general, such complaints are associated with higher vaginal pH values, which are considered normal when below 4.5.<sup>[1]</sup> The physiological pH is maintained due to the production of lactic acid by bacteria belonging to the vaginal commensal microbiota, in particular, bacteria of the *Lactobacillus* genus. Glycogen, released by epithelial cells of the vagina, acts as a substrate to lactic acid production.<sup>[1-4]</sup>

There are various profiles of vaginal microbiota.<sup>[5]</sup> Some are more prone to instability, which may lead to noticeable symptoms in women<sup>[6,7]</sup> and are generally accompanied by changes in pH values. Some bacterial dysbiosis can use lactic acid as an energy source, which may explain, in part, the elevated pH.<sup>[8,9]</sup> In such cases, there is a predominance of polymicrobial flora with anaerobic bacteria producing amines and short chain fatty acids which contribute to distinctive and unpleasant odor.<sup>[10]</sup> In addition to the different existing standards of vaginal microflora, various genital infections may be associated with pH changes, as well as the appearance and odor of vaginal secretion.<sup>[11]</sup>

## Objective

The objective of this study was to identify and describe the most common gynecological complaints and their association with the

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vaginal pH, of women of childbearing age attended at a family health-care clinic.

## Methodology

A cross-sectional study was conducted between November 2014, and March 2015, in a primary health-care clinic of Estrutural City, one of the administrative regions of the Federal District, Midwest region of Brazil.

### Ethics Committee

The study was approved by the Research Ethics Committee of the State Health Department of the Federal District (CAAE 28186514.5.0000.5553).

### Sample population

The sample of the present research was part of the participants of a larger study concerning the prevalence of *Trichomonas vaginalis* conducted in a primary health-care clinic of the Federal District of Brazil. It was selected from an outpatient population, a sample composed of women of childbearing age, except pregnant women and minors. The final sample of the present study consisted of 193 women between 18 and 49 years of age. These women were part of a group of nearly 700 childbearing age women living in the clinic coverage area. Using this number as an indicator of a finite population, assuming a 10% prevalence of infection and a 95% confidence interval (CI), the sample was calculated as 116 participants. Predicting a 20% loss during the time of the study increased this number to 139 women. As data were collected, 219 women were invited regardless of the reason that they had come to the clinic, 201 women agreed to participate, and 193 of them were examined.

### Data collection

A questionnaire, administered by a female trained interviewer, asked the participants about complaints that had occurred during the last 4 weeks. They were subsequently sent for a vaginal pH test and a test of the amines. The pH was measured using a graduated strip every 0.3 units for a range from 3.6 to 6.1 (pH-Fix®, Macherey-Nagel, Ref. 92130). The test for the detection of amines was performed by adding a drop of 10% potassium hydroxide to a sample of vaginal discharge that had been previously deposited on a glass slide. The test was considered positive with the perception of the characteristic fishy odor. Among the associated factors examined, the race/color variable was considered according to the participants' self-declarations. Since more than half of the women declared that they were brown or black, the race/color variable was grouped into two categories: White and nonwhite. Other factors examined included smoking, methods of contraception, use of vaginal douches, and use of condoms.

### Data analysis

Associations between variables were evaluated using Chi-square ( $\chi^2$ ), and the odds ratio with 95% CI, used to identify probabilities

of occurrence. The differences between proportions were verified with a one-tailed test, which was considered significant when  $Z$ -calculated  $>$   $Z$ -critical. In the case of a one-tailed curve, an error of 5% yielded a  $Z$ -critical value of 1.64.

## Results

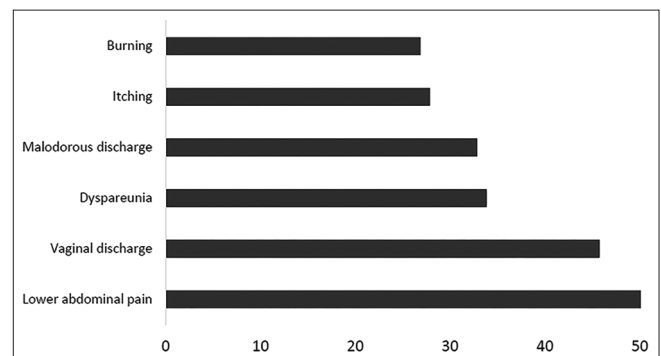
A total of 219 eligible women were invited to participate in the study. Of these, 201 women agreed, and 193 of them (96%) were examined. The average age of participants was 34 years; most of them were of mixed races (58%). There were 24% white, 13% black, and 4.5% other races.

Among the women interviewed, 78% (157/201) reported at least one gynecological complaint. The most frequent complaints were pain in the lower abdomen (50%); discharge (46%); dyspareunia (34%); unpleasant odor (33%); pruritus (28%); and burning (27%) as shown in Figure 1.

Complaints of discharge, itching, burning sensation, dyspareunia, and pain in the lower abdomen were more frequent among women who declared themselves to be white. The unpleasant odor was more frequent among nonwhite women. Considering all of the vaginal complaints, there were no significant differences between white and nonwhite women. The proportion of nonwhite women testing positive in the amines test was higher than that of white women, but there was not a significant difference [Table 1].

Of the 193 women examined, 83 (43%) had pH levels above 4.5. There was an association between higher pH ( $>$ 4.5) and the result of the amines test. An association was also identified between the pH level and complaints of discharge and unpleasant odor. No associations were found among the other complaints.

Eighty-nine women (44%) had the habit of performing regular vaginal douches. Of these, 30% (27/89) used only water and 70% (62/89) used other substances. There was an association between the performance of vaginal douches and higher pH values. In terms of the use of hormonal contraception, 31% (63/201) reported use, especially the use of pills (62%), in contrast to the use of injected contraceptives (35%). Half of the



**Figure 1:** Distribution of women interviewed according to gynecological complaints (%), 2015

women said they used condoms, but only 19% (38/201) of them used the prophylactic in all sexual relations. Preference was for the male condom in 93% of cases. There was no association between the consistent use of condoms and vaginal pH values [Table 2].

## Discussion

Species of lactobacilli present in the vaginal environment produce, in addition to lactic acid, other substances essential for maintaining the local balance of pH.<sup>[12]</sup> It is thus possible to hypothesize that an increase in pH is related to a decrease in the quantity or function of these lactobacilli. Such a situation

could result in vulnerability to dysbiosis, which results in several of the common gynecological complaints reported in primary health-care clinics.

Most vaginal complaints reported in the present study were more frequently among white women, except for the complaint of unpleasant odor. Nonwhite women had proportionately higher levels of positivity by the test of amines. Research reported in the literature has demonstrated an association between skin color, pH, and genital infections.<sup>[13]</sup> However, the participation of other variables, biological (race/ethnicity and genetic polymorphisms<sup>[14]</sup>) or socioeconomic and cultural, such as hygiene, sexual practices, and other activities that could transmit sexual maladies require more investigation.<sup>[15,16]</sup>

**Table 1: Distribution of women, according to vaginal complaints by race/color, 2015**

Complaint	White (n=49), n (%)	Nonwhite (n=152), n (%)	Variation*
Discharge	24 (48.98)	68 (44.74)	4.24
Pruritus	16 (32.65)	40 (26.32)	6.34
Burning	16 (32.65)	38 (25.00)	7.65
Unpleasant odor	14 (28.57)	52 (34.21)	-5.64
Dyspareunia	21 (42.86)	47 (30.92)	11.94
Lower abdomen pain	27 (55.10)	74 (48.68)	6.42
<b>Examination (n=193)</b>	<b>n=47</b>	<b>n=146</b>	
pH >4.5	16 (34.04)	67 (45.89)	-11.85
Positive whiff test	7 (14.89)	52 (35.62)	-20.72

n=193, except when otherwise noted. \*No significant differences were identified between white and nonwhite women

**Table 2: Distribution of women, according to associations between the variables studied and vaginal pH values, 2015**

Variables	OR (95% CI)	P
Use of hormonal contraceptives	0.51 (0.27-0.96)	0.03*
First phase of cycle (n=172)	1.19 (0.65-2.2)	0.56
Use of tobacco	3.1 (1.31-7.61)	< 0.05
Complaints		
Discharge	1.88 (1.05-3.36)	0.03*
Pruritus	0.61 (0.33-1.16)	0.13
Burning	1.33 (0.7-2.52)	0.37
Unpleasant odor	3.67 (1.96-6.88)	0.00*
Dyspareunia	1.07 (0.59-1.95)	0.81
Lower abdomen pain	1.24 (0.69-2.21)	0.46
Practices		
Oral active	1.41 (0.79-2.51)	0.24
Oral receptive	1.49 (0.83-2.65)	0.17
Anilingus active	0.99 (0.18-4.93)	0.99
Anilingus receptive	1.35 (0.44-4.19)	0.59
Anal	1.62 (0.77-3.46)	0.20
Douching	2.93 (1.62-5.33)	0.00*
Use of condoms	0.99 (0.47-2.08)	0.98
Exam		
Positive whiff test	30.62 (12.25-83.4)	0.00*

n=193, except when otherwise noted. \*P<0.05. CI: Confidence interval; OR: Odds ratio

This study found an association between pH values and the use of hormonal contraceptives, smoking and the practice of vaginal douches. As mentioned above, the substrate for production of lactic acid is glycogen, produced by vaginal epithelial cells that function under the influence of the hormonal status of the individual, especially in terms of estrogen. This may explain, in part, the protective effects exerted by hormonal contraceptives against the appearance of dysbiosis, which has been reported in a recent systematic review with meta-analyses.<sup>[17]</sup>

Another publication, also applying meta-analysis,<sup>[18]</sup> described an association between the practice of vaginal douches and changes in the vaginal balance. Our study also found an association between vaginal douches and pH, and it is known that in the case of dysbiosis, these values are generally above 4.5. These associations do not make it possible to identify causes, but a hypothesis to be considered is that vaginal douches actually contribute to an imbalance in vaginal flora.

The relationship between smoking and imbalance of the vaginal flora has also been shown in other studies,<sup>[19,20]</sup> and the basis for this association appears to be the reduction of the *Lactobacillus* vaginal flora. Unlike results reported by other author,<sup>[7,21]</sup> hormonal differences among the women of the present study occurred between the first and second phase of the menstrual cycle. These changes may explain the vaginal microbiota. It has been shown that high estrogen levels contribute to the higher stability of the vaginal ecosystem.<sup>[22]</sup>

Among the women studied, there was no significant association between vaginal pH values and the phase of the menstrual cycle. The imbalance of the vaginal environment can also occur, however, as a result of sexual intercourse,<sup>[23,24]</sup> and it is possible that various sexual practices may have different local influences. However, none of the practices here examined were associated with the pH values.

Regular use of condoms has been recommended as protection against the development of an imbalance of vaginal flora.<sup>[25]</sup> Still, for those of our sample, condom use was not associated with

vaginal pH although the analysis may have been limited by the fact that <1/5 of the women used condoms regularly.

In summary, imbalance of the vaginal microbiota is a complex situation, subject to the interference of many variables, biological, social, and cultural. This imbalance can be evaluated indirectly by measuring the pH and testing for amines, thus making it possible to administer procedures that can improve the quality of primary health care.

## Conclusions

Analysis of the information given by the women of the present study, in comparison with research reported in the literature, resulted in the following conclusions: the number of women having at least one complaint was high, with nearly 80% of participants; the practice of vaginal douches was quite widespread, even though not recommended; higher pH values and positive results from the test of amines were associated with reports of discharge and complaints of unpleasant odor; the proportion of nonwhite women who tested positive for amines was significantly greater than the proportion of white women.

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## Conflicts of interest

There are no conflicts of interest.

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