

Epidemiological profile and factors associated with cervicalvaginal infections in quilombola women submitted to preventive examination

Perfil epidemiológico e fatores associados às infecções cérvico-vaginais em mulheres quilombolas submetidas ao exame preventivo

Perfil epidemiológico y factores asociados a infecciones cérvico-vaginales en mujeres quilombolas sometidas a examen preventivo

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ABSTRACT

Background and Objectives: reproductive tract infections are considered an important demand for women's health, due to their high prevalence in the population and the consequences they can cause, such as premature birth, infertility and cervical cancer. There are still women who do not undergo cytopathological examination, capable of preventing these infections, either due to lack of guidance or opportunity, such as *quilombola* women. This study aimed to identify factors associated with cervicovaginal infections in *quilombola* women from Feira de Santana, Bahia.

Methods: a descriptive study, carried out in a transversal way and with a quantitative approach. Data collection was carried out from November 2019 to January 2020, with the application of an anamnesis form prepared by the team, with variables used in other studies, such as risk factors. Bivariate analysis was performed to obtain prevalence ratios (PR) between infections and the characteristics found. **Results:** a total of 82 women were studied, with an average age of 45.3 years. The main vaginal infections were caused by *Gardnerella vaginalis* (17.1%), *Trichomonas vaginalis* (8.5%), *Cocci* (8.5%), *Candida spp.* (6.2%) and *Fusobacterium spp.* (1.2%). In 88.2% of infected women, inflammation was present. **Conclusion:** the results obtained in this study showed a correlation between the inflammatory process in women and the presence of some infection. With regard to infections, there was a higher prevalence in women with low education, without a steady partner and who did not undergo regular preventive examination.

Keywords: Cervical Neoplasms. Pap Test. Vaginal Smear. Risk Factors.

RESUMO

Justificativa e Objetivos: as infecções do trato reprodutivo são consideradas uma demanda importante para a saúde da mulher, devido à sua alta prevalência na população e às consequências que podem causar, como parto

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premature, infertility and cancer of the cervix. There are still women who do not perform a cytological exam, capable of preventing these infections, either for lack of orientation or opportunity, like the quilombolas. This study aimed to identify factors associated with cervicovaginal infections in quilombolas from Feira de Santana, Bahia. **Methods:** descriptive study, carried out transversally and with quantitative approach. Data collection was carried out from November 2019 to January 2020, with the application of a history form elaborated by the team, with variables used in other studies, such as risk factors. Bivariate analysis was carried out to obtain reasons for prevalence (RP) between infections and characteristics found. **Results:** 82 women were studied, with a mean age of 45.3 years. The main vaginal infections were caused by *Gardnerella vaginalis* (17.1%), *Trichomonas vaginalis* (8.5%), *Cocci* (8.5%), *Candida spp.* (6.2%) and *Fusobacterium spp.* (1.2%). In 88.2% of the infected women, inflammation was present. **Conclusion:** the results obtained in this study showed a correlation between the inflammatory process in women and the presence of some infection. No one who refers to infections, there was higher prevalence in women with low education, without a fixed partner and who did not perform regular preventive exams.

Palavras-chave: Neoplasias Cervicais. Exame de Papanicolaou. Esfregaço Vaginal. Fatores de risco.

RESUMEN

Justificación y Objetivos: las infecciones del aparato reproductor son consideradas una demanda importante para la salud de la mujer, por su alta prevalencia en la población y las consecuencias que pueden ocasionar, como parto prematuro, infertilidad y cáncer de cuello uterino. Todavía hay mujeres que no se hacen un examen citopatológico, capaz de prevenir estas infecciones, ya sea por falta de orientación o de oportunidad, como las mujeres quilombolas. Este estudio tuvo como objetivo identificar los factores asociados a las infecciones cervicovaginales en mujeres quilombolas de Feira de Santana, Bahia. **Métodos:** estudio descriptivo, realizado de forma transversal y con enfoque cuantitativo. La recolección de datos se realizó de noviembre de 2019 a enero de 2020, con la aplicación de un formulario de anamnesis elaborado por el equipo, con variables utilizadas en otros estudios, como los factores de riesgo. Se realizó análisis bivariado para obtener razones de prevalencia (RP) entre las infecciones y las características encontradas. **Resultados:** se estudiaron un total de 82 mujeres, con una edad promedio de 45,3 años. Las principales infecciones vaginales fueron causadas por *Gardnerella vaginalis* (17,1%), *Trichomonas vaginalis* (8,5%), *Cocci* (8,5%), *Candida spp.* (6,2%) y *Fusobacterium spp.* (1,2%). En el 88,2% de las mujeres infectadas hubo inflamación. **Conclusión:** los resultados obtenidos en este estudio mostraron una correlación entre el proceso inflamatorio en la mujer y la presencia de alguna infección. En cuanto a las infecciones, hubo mayor prevalencia en mujeres con baja escolaridad, sin pareja estable y que no realizaban examen preventivo periódico.

Palabras clave: Neoplasias Cervical. Prueba de Papanicolaou. Frotis vaginal. Factores de riesgo.

INTRODUCTION

The relationship between hormone production, environment and the presence of aerobic and anaerobic microorganisms result in the cervicovaginal microbiota. The presence of bacteria plays an important role in protecting against pathogens, living commensal with the host, such as *Lactobacillus spp.* The vaginal microbiota is directly influenced by physiological changes, such as a woman's age, menstrual cycle, pregnancy, medication use and sex life, mainly increasing the risk of reproductive tract infections (RTI).^{1,2} RTIs can be asymptomatic and are considered a public health case, due to their high prevalence in the female population and the consequences they can cause, such as premature birth, infertility and cervical cancer (CC).³

CC is considered an important problem worldwide, and, despite having low developmental progression, benefiting early diagnosis and increasing the chances of cure, it is one of the most frequent, representing 3.2% of all cancers, with risk estimated at 15.1/100 thousand women, ranking fourth. The Brazilian National Cancer

Institute (INCA - *Instituto Nacional de Câncer*) noted that CC is more incident in developing countries and estimated about 16,590 new cases for each year between 2020-2022 in Brazil, in addition to recording 6,385 cases of deaths in 2017 in the country. Excluding non-melanoma cancer, CC is the second most prevalent in northeastern Brazil, with 17.62 cases per 100,000 women.⁴

As a form of prevention, the Ministry of Health recommends performing a Pap smear for women over 25 years of age, better known as Pap smear. This test is capable of detecting cellular alterations in advance, contributing to an efficient treatment of the alterations found and, although its focus is on the identification of lesions, it is also effective in diagnosing cervicovaginal infections, such as the human papillomavirus (HPV), indicated as a necessary factor for the appearance of CC, when associated with some risk factor.^{4,5}

It is considered a low-cost and easily accessible test; however, there are women who do not perform it, because they belong to population groups that do not have basic health care and monitoring, such as *quilombola* (a *quilombola* is an Afro-Brazilian resident of *quilombo*

settlements first established by escaped slaves in Brazil) communities. As a result of the historical trajectory of this group and as a response to the strong prejudice suffered over time, the descendant population of the *quilombo* became resistant and geographically isolated. Most of them are not assisted and have limited access to health care, which tends to hamper the gynecological follow-up of women, leaving them more vulnerable to cervicovaginal infections and the development of CC.^{6,7}

This study aimed to identify factors associated with cervicovaginal infections in *quilombola* women from Feira de Santana, Bahia.

METHODS

This is a cross-sectional study, carried out with women from a *quilombola* community in Feira de Santana-BA, from November 2019 to January 2020.

Prior to data collection, meetings were held with the community and their respective leaders to present the project, explain the importance of the research and clarify doubts. At the end of the meetings, the leaders signed a Participation Term, consenting to carry out the research in the community. Before the collection of materials, a questionnaire, prepared by the research team, was applied to individuals who agreed to participate in this investigation. The community has 573 inhabitants; of these, 301 (52.5%) are women. Sexually active women were included and pregnant women were excluded. For the research, 95 women were included, who were willing to participate in the study, making it necessary to sign the Informed Consent Form (ICF) for women aged 18 years and older. For underage and sexually active girls who expressed interest, the Assent Form was sent for signature, and those responsible signed the specific consent form for them.

Cervicovaginal samples were collected between November 2019 and January 2020, at the Family Health Unit of the community, and were performed by team nurses. The slides were stained using the Papanicolaou technique. The reports were issued and classified according to Bethesda System's latest update and according to the Ministry of Health recommendations, both steps performed by biomedical staff. Soon after, the results were delivered to the patients, accompanied by the necessary guidelines from the team to seek medical help.

Of the total sample, nine participants were excluded, due to the fact that the cervicovaginal sample was considered unsatisfactory by the biomedical doctor, and another four, for not having completed the questionnaire. The following were considered as independent variables: alcohol consumption (yes and no); vaginal complaints (yes and no); smoking (yes and no); age (≤ 45 years and ≥ 46 years); education (elementary and high school); skin color (white and non-white); number of lifetime sexual partners (≤ 3 partners and ≥ 4 partners); fixed partner (yes and no); use of contraceptive methods (yes and no); age at first intercourse (≤ 17 years and ≥ 18 years); and frequent use of preventive measures (yes and no). The variable vaginal infection (yes and no) was considered as

the main outcome.

Initially, data were analyzed using descriptive statistics, and as the study did not present continuous quantitative variables, it was decided to perform a bivariate analysis, estimating the raw Prevalence Ratio (PR) and its respective confidence intervals (CI) and p-values by Pearson's chi-square test, with a significance level of 5%, using STATA, version 15.0, StataCorp LLP, 2017.

This study is part of a research entitled *Prevalência da Infecção pelo Papilomavírus humano (HPV) em Mulheres Quilombolas do Recôncavo Baiano*, in partnership with *Faculdade Maria Milza (FAMAM)* and *Universidade Federal do Recôncavo da Bahia (UFRB)*. The project was submitted and approved by the Research Ethics Committee of FAMAM-BA, with Opinion 3,648,330 and CAAE (*Certificado de Apresentação para Apreciação Ética - Certificate of Presentation for Ethical Consideration*) 87619618.1.0000.5025, in compliance with Resolution 466/2012 of the Brazilian National Health Council (*Conselho Nacional de Saúde*).

RESULTS

The study was carried out with 82 women from the community, whose average age was 45.3 years. Most women had the preventive examination diagnosis within the limits of normality (without vaginal infection) in the material collected (58.5%); however, there were benign cellular alterations with the presence of microorganisms, mainly *Gardnerella vaginalis* (17.1%) (Table 1).

Table 1. Frequency of cervicovaginal infections in quilombola women, Feira de Santana-BA, November 2019 to January 2020.

Microorganisms		%
Gardnerella vaginalis	4	17.1
Gardnerella vaginalis +		8.5
Trichomonas vaginalis		8.5
Cocos		6.2
Candida spp		1.2
Fusobacterium spp		58.5
No vaginal infection	8	100
Total	2	

As a result of reactive cellular changes, it was observed that 36.6% of all women had inflammation, with a mean age of 40.33 years, whose main agent was *Gardnerella vaginalis* (73.3%).

Women who had access only to elementary school had a higher prevalence of infections (61.8%), non-white (100%), without a steady partner (52.9%), did not undergo preventive measures regularly (64.7 %) (Table 2).

Table 2. Distribution of characteristics and prevalence ratios of cervicalvaginal results of quilombola women, Feira de Santana-BA, November 2019 to January 2020.

Variables	Infected n (%)	Non Infected n (%)	TOTAL N (%)	PR (95% CI)	(p)
Alcoholism					
Yes	11 (32.4)	17 (35.4)	28 (34.1)	0.92 (0.52-1.60)	0.773
No	23 (67.6)	31 (64.6)	54 (65.9)	1.00	
Vaginal complaints					
Yes	10 (29.4)	19 (39.6)	29 (35.4)	0.76 (0.42-1.36)	0.349
No	24 (70.6)	29 (60.4)	53 (64.6)	1.00	
Age					
≤ 45 years	17 (50)	25 (52.1)	42 (51.2)	1.00	
≥ 46 years	17 (50)	23 (47.9)	40 (48.8)	1.05 (0.62-1.75)	0.852
Education					
Access to elementary school	21 (61.8)	31 (64.6)	52 (63.4)	0.93 (0.55-1.57)	0.794
Access to high school	13 (38.2)	17 (35.4)	30 (36.6)	1.00	
Skin color					
White	0 (0)	3 (6.3)	3 (3.7)	-	-
Non-white	34 (100)	45 (93.7)	79 (96.3)	-	-
Sexual partners					
≤ 3 partners	26 (76.5)	40 (83.3)	66 (80.4)	1.00	
≥ 4 partners	8 (23.5)	8 (16.7)	16 (19.6)	1.26 (0.71-2.25)	0.439
Fixed partner					
Yes	16 (47.1)	27 (56.3)	43 (52.4)	1.00	
No	18 (52.9)	21 (43.7)	39 (47.6)	1.24 (0.74-2.07)	0.411
Contraceptive methods					
Yes	17 (50)	18 (37.5)	35 (42.7)	1.34 (0.80-2.23)	0.259
No	17 (50)	30 (62.5)	47 (57.3)	1.00	
First intercourse					
≤ 17 years	17 (50)	15 (31.3)	32 (39)	1.56 (0.94-2.58)	0.086
≥ 18 years	17 (50)	33 (68.7)	50 (61)	1.00	
Preventive					
Yes	12 (35.3)	19 (39.6)	31 (37.8)	0.89 (0.52-1.54)	0.693
No	22 (64.7)	29 (60.4)	51 (62.2)	1.00	
Smoker					
Yes	1 (2.9)	1 (2.1)	2 (2.4)	1.21 (0.29-4.96)	0.8041
No	33 (97.1)	47 (97.9)	80 (97.6)	1.00	

Caption: PR - Prevalence Ratio; CI - confidence interval.

DISCUSSION

A correlation between the factors associated with infections caused by agents capable of injuring cervico-vaginal cells, especially anaerobic bacteria, is necessary, given the importance of prevention and incidence control worldwide. These agents act in the transformation zone, stimulating the replacement of glandular epithelium by squamous epithelium, characterizing squamous metaplasia. In this process, there is greater susceptibility to CC, because these cells are more permissive to HPV infection.⁶

Among the 82 patients studied, 34 (41.5%) had cases of vaginal infections, being 21 (25.6%) positive for *Gardnerella vaginalis*, with a mean age corresponding to 42.4 years, a higher value than that found in Rio Grande do Sul,⁹ in women treated at Basic Health Units, with 5.1% cases of *Gardnerella vaginalis*. A study carried out with quilombola women assisted by the Unified Health System (*Sistema Único de Saúde*) of municipalities in Maranhão⁶

found 27.7% of cases of infection by *Gardnerella vaginalis*, however, with a higher prevalence in women <30 years. *Gardnerella vaginalis* is identified as the main cause of bacterial vaginosis, due to its high power of pathogenicity, such as the ability to adhere to vaginal epithelial cells, biofilm formation (favoring the adhesion of other anaerobic microorganisms), and the production of the toxins vaginolysin (cytolysin that induces vaginal epithelial cell lysis) and sialidase (an enzyme capable of degrading cervical mucus).¹⁰ In 50% of infected women, bacterial vaginosis (BV) is asymptomatic and facilitates the transmission of sexually transmitted infections (STIs).¹¹

In the present study, of these 21 women, 7 (8.5%) had co-infection with *Trichomonas vaginalis*, similar data to the study carried out in women from southern Brazil¹², with 9% of the cases represented. The value found in this study was higher than that found in a prenatal care clinic in Ghana,³ with 1.4%. *Trichomonas vaginalis* is the pro-

tozoan responsible for causing trichomoniasis, the most prevalent non-viral STI worldwide, where the population most in need of guidance and basic health care is more susceptible to infection, which is caused by changes in the cervicovaginal balance, since the diagnostic method is inaccessible to some health professionals and public laboratories in the country.¹²

Among the infected women, 7 (8.5%) had in their results the presence of *cocci*, with an average age of 39.7 years, values below the studies carried out in women from the semi-arid region of Paraíba,¹³ with 40.12% and 32% in women assisted at a health unit in Barreiras, Bahia.¹⁴ The presence of *cocci* on cervicovaginal cytology may appear without being associated with any alteration, as they are part of the normal female microbiota. However, with imbalance, it can cause inflammation and infection, and, in some cases, asymptotically.¹⁵

Of the cases found, *Candida spp.* was represented with 5 (6.2%) cases, with an average age of 45.5 years, which is lower than the study carried out with pregnant women,³ which found 36.5%. Women treated at basic health units⁹ had a result below that found in this study, with 5.1% of cases of infection by *Candida spp.* The yeast *Candida spp.* is a fungus that can live in the vaginal microbiota commensally and without causing symptoms in 50% of women. When balance is affected, strains of *Candida spp.* multiply excessively, accounting for 85% to 90% of cases of vulvovaginal candidiasis.¹⁶

Only one patient (1.2%), aged 58 years, was diagnosed with *Fusobacterium spp.*, prevalence similar to that found in a hospital in Curitiba,¹⁷ accounting for 1.17% of cases. *Fusobacterium spp.* is a gram-negative, anaerobic bacillus found in the normal microbiota of the mouth and intestinal mucosa. However, the correlation between *Fusobacterium spp.* and colorectal and CC due to the production of FadA is mentioned, a virulence factor capable of resulting in the proliferation of carcinogenic cells.¹⁸

In general, in women's vaginal microbiota, *Lactobacillus spp.*, accounting for 47.6% of cases, was found to be more prevalent. *Lactobacillus* are found in healthy women and maintain the cervicovaginal balance by producing lactic acid (making the pH of the vagina acidic), hydrogen peroxide and bacteriocins, preventing infection by other pathogenic microorganisms.⁶ The reduction of *Lactobacillus* contributes to STIs and can cause BV. On the other hand, the disordered increase implies the exacerbated production of lactic acid and consequent decrease in pH, which can cause cytolytic vaginosis.^{1,2}

Given the high rate of infection in cases of inflammation, the importance of its identification during examination is emphasized. The main pathogens identified capable of causing this type of benign alteration are *Gardnerella vaginalis*, *Trichomonas vaginalis* and *Candida spp.* These microorganisms were also cited as causing inflammation in a study carried out in a city in Rio Grande do Sul.⁵ The results corroborate this study, since the 30 women diagnosed with inflammation were infected with one of these pathogens, in addition to from infection by *Fusobacterium spp.* Early diagnosis of these

microorganisms is extremely important, as inflammation can camouflage the presence of malignant changes in the smear and facilitate infection by other microorganisms.¹⁵

The risk factors associated with the infections found were not statistically significant in this study.

In this study, 32.4% of infected women reported consuming alcohol. Alcohol consumption generates oxidative stress, through the p450 2E1 enzyme, and is linked to the development of CC, due to the relationship of antioxidant enzymes and detoxifying pathways to cells transformed by HPV.¹⁹ Moreover, alcohol consumed before sexual intercourse increases libido and decreases reasoning.²⁰ Thus, the chance of having sex without using condoms increases and, consequently, the risk of acquiring STIs.²¹

Among infected women, 29.4% had some type of vaginal complaint. This data may be related to the fact that infection by *G. vaginalis*, *T. vaginalis* and *Candida spp.* can be asymptomatic in most cases, reinforcing the importance of performing a preventive examination and gynecological follow-up, and not just a diagnosis based on the presence of symptoms, since the lack of them does not exclude the presence of infection.^{11,15} The results found in a city in Rio Grande do Sul⁵ brought the average age among women to 45.76 years, a value similar to that of this study, which had a mean age of 45.3 years.

It was observed in a survey carried out with women with CC that patients with higher levels of education tend to seek health care and have more information.²² A study carried out on STIs in women deprived of liberty²¹ points to a higher prevalence of vaginal infection in women with incomplete primary education (34.5%), a result that is similar to that found in this study, which found most infections (61.8%) in women with access only to elementary education. There was no infection in self-declared white women, so 100% of the infection cases affected non-white women. This high prevalence may have been due to the small sample of white women registered in this study. On the other hand, another study found a higher prevalence of infections in non-white women and associated this data with historical factors, in which the black population and their descendants are socioeconomically less supported and without assistance, contributing as a risk factor for vaginal infections.²³

Regarding the number of sexual partners, the highest prevalence of infections was among women who reported having less than 3 sexual partners in their lifetime (76.5%), although other studies found a higher prevalence in women with four or more sexual partners, as in exchange students in Portugal,²⁴ associating infections with high exposure and a greater chance of sexual intercourse with an infected partner, which can increase the spread of infections. The higher prevalence of infections in women who reported not having a steady partner (52.9%) is consistent with the results found in exchange students in Portugal, since women with a steady partner are less likely to have contact with infected individuals.

A study on STIs in women deprived of their liberty found a prevalence of 53.1% of cases in patients who said they never used condoms.²¹ In the present study, the

percentage was the same for both women who claimed to use it and for those who did not, accounting for 50%. The use of contraceptive methods does not prevent infections and, therefore, the WHO suggests using condoms, because it provides a physical barrier preventing the passage of bacteria and viruses. The average age of the first intercourse of women with some infection is 14.2 years, lower than a study carried out with exchange students in Portugal,²⁴ which found 17.6 years, but that emphasizes the importance of the age at the first sexual intercourse, since it has been decreasing over the years, and the rate of adolescents under the age of 16 who are sexually active has been increasing, as shown in this study. The younger the adolescent, the less likely it is to contain information and the greater the risk of risky sexual behavior and, consequently, the risk of STIs.

Most women with infection reported not having a preventive examination frequently (64.7%). This finding reinforces the need for gynecological follow-up and preventive examinations, at least once a year, for better assistance, prevention and treatment of cervical infections.^{4,14} In this study, 97.1% of women who had an infection said they were not smokers, however its relationship as a risk factor for cervical infections has been proven in some studies, due to the presence of carcinogenic substances with transformational action on the cervix, leading to immunosuppression and favoring infection by pathological agents.¹⁹

As a result of the racism suffered since the time of slavery, the black population is a victim of cultural devaluation and faces daily challenges in all social spheres, such as education, poverty and health. This situation worsens when it comes to *quilombola* communities, especially women, highlighting the difficulty of medical consultation, carrying out preventive examination and the association with CC, nutritional risks, among other problems. Black women have lower life expectancy when compared to white women, evidencing the complications of access to health.^{5,25}

The limitations inherent to this study are characterized by the sample studied, as there is resistance from the *quilombola* population and low demand for preventive examinations. Thus, these results should not be extended to the general population. It is also necessary to mention that some information may have been omitted by the women interviewed, depending on the particularity of the topic, in addition to the possibility of indecision to answer questions such as the age of the first intercourse and the number of sexual partners. It is worth mentioning the need for further research in this community to prove the results and investigate the main cause of infections.

Considering the results analyzed and discussed in this study, *G. vaginalis* was the most prevalent infectious agent in women in this *quilombola* community. Although there are no statistically significant results among the analyzed characteristics, in this study, there was a higher prevalence of infections in women with low education, without steady partners and without frequent Pap smears. Thus, it becomes evident the need for guidance

and ways to rescue these women for better monitoring and carrying out preventive examination.

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