



CLÍNICA

Infection by Human Papillomavirus (HPV) in women bearers of HIV/AIDS

Infecção pelo Papilomavírus Humano (HPV) em mulheres portadoras de HIV/AIDS

Infección por el Virus del Papiloma Humano (VPH) en mujeres con VIH /SIDA

*Rodrigues, Bianca Gonçalves **Holzmann, Ana Paula Ferreira *Santos, Amanda Gesiele Pereira *Lima, Cássio de Almeida ***Gonçalves, Renata Patrícia Fonseca ****Santos, Silvânia Paiva dos

*Nurse Graduated from the State University of Montes Claros (UNIMONTES). E-mail: akira_lp_shinoda@hotmail.com **Nurse. MSc in Science. PhD Student in Science at the Nursing School of São Paulo-Federal University of São Paulo (UNIFESP). Professor at the Nursing Department of UNIMONTES.***Nurse. Graduated from UNIMONTES. Postgraduation Student in Emergency, Trauma and Intensive Care at UNIMONTES. ****Nurse. Graduated from UNIMONTES.*****Nurse. MSc in Nursing. PhD Student in Nursing at the Nursing School of the Federal University of Minas Gerais (EE-UFGM). Professor at the Nursing Department of UNIMONTES.*****Nurse. MSc in Nursing. Professor at the Nursing Department of UNIMONTES.

Keywords: Papillomavirus infections; HIV infections; women; Vaginal platinum loop for smears

Palabras chave: Infecções por Papilomavírus; Infecções por HIV; Mulheres; Esfregaço vaginal

Palabras clave: Infecciones por Papilomavirus; Infecciones por VIH; Mujeres; Frotis vaginal

ABSTRACT

Objective: Verify the predominance of HPV in women bearers of HIV/AIDS, and know the social demographic, clinic and behavior characteristics of this population.

Methods: Documental, exploratory, descriptive and quantitative study that included the promptuary of 32 women with HIV/AIDS in the CERDI system and that were submitted to the Papanicolaou test during the period of study.

Results: HPV lesions were found in (15.6%) of the women, having the classification of LSIL low grade (60%) of these. Age varied between 18 to 39 (62.5%), married or in common-law marriage (75.1%) and the majority hasn't finished middle school (37.5%). Regarding to family income, 46.9% informed income same or lower to the minimum wage. They started their sexual activity with age lower than 17 (62.5%), had less than four sexual partners in their life (56.3%) and only one partner during the last year (96.9%). No women referred to the regular use of condoms before the diagnosis of HIV, after the

diagnosis, 62.5% started to use in all their sexual relations. Sexual diseases prior history were reported by (40.6%), probable way of virus transmission were by sexual means (93.8%) and the diagnosis of infection was done over five years for the majority (56.3%). Most of them also make use of TARV (65.6%) and presented a CD4 cell count same or over 500 cells/ml (59.4%) in the last test.

Conclusions: There were prevalence of HPV in 15.6%, similar to other studies. The need of a periodic Papanicolaou test to detect early alterations is highlighted to avoid cervical cancer.

RESUMO

Objetivo: Verificar a prevalência do HPV em mulheres vivendo com HIV/AIDS, e conhecer as características sociodemográficas, clínicas e comportamentais dessa população.

Métodos: Estudo documental, exploratório, descritivo, quantitativo, que incluiu os prontuários de 32 mulheres vivendo com HIV/AIDS cadastradas no CERDI e que realizaram o exame de Papanicolaou no período do estudo.

Resultados: Foram encontradas lesões de HPV em (15,6%) das mulheres, sendo classificadas como LSIL baixo grau (60%) desses. A idade variou de 18 a 39 anos (62,5%), casadas ou vive em união estável (75,1%) e a maioria tem ensino fundamental incompleto (37,5%). Quanto à renda familiar, 46,9% informaram renda igual ou inferior a um salário mínimo. Iniciaram atividade sexual com idade inferior a 17 anos (62,5%), tiveram menos de quatro parceiros sexuais na vida (56,3%) e parceiro único no último ano (96,9%). Nenhuma mulher referiu uso regular de preservativos antes do diagnóstico de HIV, sendo que, após o diagnóstico, 62,5% passaram a usar o insumo em todas as relações sexuais. História anterior de DST foi relatada por (40,6%), provável forma de transmissão do vírus foi a via sexual (93,8%) e o diagnóstico da infecção foi realizado há mais de cinco anos (56,3%) para a maioria. A maioria também faz uso de TARV (65,6%) e apresentou contagem de células CD4 igual ou maior que 500 células/mL (59,4%), no último exame realizado.

Conclusões: Houve uma prevalência de HPV de 15,6%, semelhante a outros estudos. Destaca-se a necessidade do exame de Papanicolaou periódico para se detectar precocemente alterações, evitando-se o câncer cervical.

RESUMEN

Objetivo: Verificar la prevalencia del VPH en mujeres viviendo con VIH/AIDS, y conocer las características sociodemográficas, clínicas y comportamentales de esa población.

Métodos: Estudio documental, exploratorio, descriptivo, cuantitativo, que incluyó los historiales de 32 mujeres viviendo con VIH/AIDS registradas en el CERDI y que realizaron el examen de Papanicolaou en el período de estudio.

Resultados: Se encontraron lesiones de VPH en (15,6%) de las mujeres, siendo clasificada como LSIL bajo grado (60%) de estas. La edad varió de 18 a 39 años (62,5%), casadas o vive en unión estable (75,1%) y la mayoría tiene bachillerato incompleto (37,5%). En cuanto a la renta familiar, 46,9% informó renta igual o inferior a un sueldo mínimo. Iniciaron actividad sexual con edad inferior a 17 años (62,5%), tuvieron menos de cuatro parejas sexuales en la vida (56,3%) y pareja única en el último año (96,9%). Ninguna mujer se refirió al uso regular de preservativos antes del diagnóstico de VIH, siendo que, tras el diagnóstico, 62,5% pasaron a usar el insumo en todas las relaciones sexuales. Historia anterior de DST fue relatada por (40,6%), probable forma de transmisión del virus fue la vía sexual (93,8%) y el diagnóstico de la infección se realizó hace más de cinco años (56,3%) para la mayoría. La mayoría también hace uso de TARV (65,6%) y presentó recuento de células CD4 igual o mayor que 500 células/mL (59,4%), en el último examen realizado.

Conclusiones: Hubo prevalencia de VPH de 15,6%, semejante a otros estudios. Se destaca la necesidad de examen de Papanicolaou periódico para detectar precozmente alteraciones, evitándose el cáncer cervical.

INTRODUCTION

Sexually Transmitted Diseases (STD) represent a serious public health problem. Among the most prevalent STD in the sexually active population is infection with human papillomavirus (HPV)⁽¹⁾. Currently, more than 100 types of HPV have been identified, of which 20 can infect the genital tract, assuming greater importance for the probable relationship to cancer⁽²⁾.

Invasive cervical cancer and its precursor lesions are the most important gynecological manifestations of HPV infection. These lesions, also known as cervical intraepithelial neoplasia, are classified according to their degree of involvement of the cervical epithelium. In Brazil, the current classification system for cervical lesions is based on the Bethesda system, in which the lesions are classified into low degree (LSIL) and high grade (HSIL)^(3,4).

The Human Immunodeficiency Virus (HIV) is the leading cause that expresses HPV infection. The high incidence of HIV infection, especially in developing countries, has increased the prevalence of HPV infection, being the oncogenic high-risk virus the most common, which makes it even more worrying given its evolution for cervical neoplasia⁽⁵⁾. In 1993, invasive cervical cancer was added to the list of diseases that define the clinical condition of acquired immunodeficiency syndrome (AIDS) by the Centers for Disease Control and Prevention (CDC) of the United States⁽⁶⁾.

Infections by HIV and HPV are related to similar predisposing factors, which facilitates their coexistence. Both are associated with low socioeconomic status, multiple partners, early first sexual intercourse, unprotected sexual intercourse, multiparity, among other factors⁽⁷⁾.

In Brazil, the Ministry of Health indicates cervical cancer screening through cytopathologic tests as a strategy for the prevention of cervical cancer. This test, known as Pap test, has reduced the invader cervical cancer incidence rates to proportions up to 90% and is widely recognized for its safety, sensitivity and low cost^(2,8). The latest advance in the prevention of HPV infection concerns the creation of two vaccines: the quadrivalent (Merck) against HPV 6, 11, 16 and 18, and bivalent (GSK) against HPV 16 and 18. The duration of the vaccine efficacy is five years, being its reinforcement indicated after this period, and is available in public health service for girls aged 11 to 13 years^(9,10).

HIV changes the natural history of HPV infection, with reduced regression rates, progression to high-degree lesions and invasive lesions, refractory to treatment, thus requiring greater intervention and monitoring⁽¹¹⁾. It is important to notice that factors related to HPV-HIV coinfection as viral types, changes in immune status and presence of cytological changes when crossed with different populations may reveal conflicting results, which reflects the importance of knowledge of regional, ethnic, behavioral and demographic characteristics of the population, so that one can appropriately intervene⁽⁵⁾.

Thus, the objective of this study is to determine the prevalence of HPV in women living with HIV/AIDS registered in a Specialized Care Service (SAE) at the city of Montes Claros, Minas Gerais, as well as to know the sociodemographic, clinical and behavioral characteristics this population, possibly associated with the risk of cervical cancer.

METHODOLOGY

Documentary, exploratory and descriptive study, with quantitative approach, developed in the Reference Center for Infectious Diseases (CERDI) from the city of Montes Claros. It is a unit of reference for treatment and monitoring of patients with HIV/AIDS of Montes Claros and other cities in northern Minas Gerais. Currently, 236 HIV/AIDS patients are attended at this unit, being 88 males and 113 females, and 35 children exposed to the virus. The service has a multidisciplinary team, and support from professionals in the laboratory area for the care of their customers.

The study sample included the medical records of all women living with HIV/AIDS registered in CERDI and who underwent the Pap test at this unit from August 2013 to April 2014.

Data were collected through hospital records and the variables of interest were initially launched in a manual filling sheet, considering the social-demographic, behavioral, information on HIV/AIDS and results of the Pap test. The collected data were processed by the Statistical Package for Social Sciences (SPSS) version 18.0 and descriptively analyzed by calculating the absolute and relative frequencies.

This study is in accordance with the ethical principles determined by Resolution number 466 of 2012 and was approved by the Research Ethics Committee of the State University of Montes Claros - Unimontes, under opinion number 537. 304.

RESULTS

In the defined period for collecting data, 32 women living with HIV/AIDS have sought the service to undergo the test for prevention of cervical cancer, which represents 28.3% of the total population of women registered in CERDI. As shown in Table 1, most of them are from 18 to 39 years old (62.5%), married or living in a stable union (75.1%) and has incomplete primary education (37.5%). As for the family income, 46.9% of women reported income equal to or less than the minimum wage.

Table I. Distribution of the study participants according to social-demographic characteristics, Montes Claros, MG, Brazil (n=32).

Variable	N	%
Age		
18 - 29 years	08	25.0
30 - 39 years	12	37.5
40 - 49 years	07	21.9
50 - 59 years	04	12.5
Over 60 years	01	3.1
Marital Status		
Single	02	6.3
Married	10	31.3
Divorced	05	15.6
Widow	01	3.1
Stable union	14	43.8
Educational Attainment		
Incomplet elementary school	12	37.5

Complet elementary school	05	15.6
Incomplet high school	05	15.6
Complet high school	07	21.9
Complet higher education	02	6.3
Illiterate	01	3.1
Monthly income		
Less than one minimum wage	07	21.9
One minimum wage	08	25.0
More than one minimum wage	15	46.9
Uninformed	02	6.3

As for characteristics related to behavior and women's sexual life, it is clear that most initiated sexual activity younger than 17 years (62.5%), had less than four sexual partners in life (56.3%) and one partner in the last year (96.9%). No women reported regular use of condoms before diagnosis of HIV, and, after diagnosis, 62.5% began to use them in all sexual relations. Prior history of STD was reported by 37.5% of women.

Table 2. Characteristics related to the sexual behavior of the study population, Montes Claros, MG, Brazil (n=32).*

Variable	N	%
Beginning of sexual activity		
< 17 years	20	62.5
≥ 17 years	12	37.5
Sexual partners in the last year		
1 partner	31	96.9
More than 1 partner	01	3.1
Sexual partners in life		
< 4 partner	18	56.3
≥ 4 partners	14	43.8
Use of preservatives before HIV		
No	17	53.1
Sometimes	15	46.9
Use of preservatives after HIV		
Yes	20	62.5
No	03	9.4
Sometimes	06	18.8
Did not have sexual intercourse	03	9.4
History of other STD		
Yes	12	40.6
No	19	59.4

By observing Table 3, which shows the variables related to HIV/AIDS, it appears that the likely form of virus transmission was sexual contact (93.8%) and the diagnosis of infection was held more than five years ago (56.3%) for most women. Most women also uses ART (65.6%) and showed CD4 cells count equal to or greater than 500 cells/ml (59.4%), at the last performed test.

Table 3. Distributio of the Clinical Variables related to HIV/AIDS infection in the study population, Montes Claros, MG, Brasil (n=32).*

Variable	N	%
Likely form of transmission of vírus		
Sexual	30	93.8
Blood transfusion	1	3.1
Unknown	1	3.1
Use of antirretroviral therapy (ART)		
Yes	21	65.6
No	11	34.4
CD4 value		
Lower than 200	2	6.3
Between 200 and 499	10	31.3
Equal too r higher than 500	19	59.4
Time of diagnosis		
Less than 01 year	9	28.1
From 1 to 5 years	5	15.6
More than 5 years	18	56.3

When analyzing the results of the users' cytopathology tests, there were HPV lesions in 15.6% of women, classified as LSIL low-grade in 60% of these.

Table 4. Prevalence and classification of the HPV lesions in the study population, according to the results of the cytological tests, Montes Claros, MG, Brazil (n=32).

Variable	N	%
Evidence of HPV lesions in PT		
Yes	5	15.6
No	27	84.3
Total	32	100.0
Classification of the lesion degree		
LSIL low degree	3	60.0
HSIL high degree	2	40.0
Total	5	100.0

DISCUSSION

This study was based on secondary data and, thus, is subject to limitations that may, in greater or lesser extent, affect the reported results. It is noteworthy the non-representation of the study population compared to the general population.

Other limiting factors of this study are related to the sample size and the type of methodology used for the diagnosis of HPV infection in this population. The Pap test is an affordable and fast method that theoretically can be used in the identification of HPV infection⁽¹²⁾; however, the significant rate of false-negative and the variation of the interobserver results make the use of other complementary diagnostic methods necessary^(13,14), which was not conducted with the patients in this study, according to the medical record. It is noteworthy that this method does not detect the virus, but detects cellular changes caused by it⁽¹²⁾. The main causes of false-negative results occur due to inadequate collection of material and/or error in the interpretation of cytological findings⁽¹⁵⁾.

Currently, molecular biology tests, which seek to identify the DNA of the virus, are considered the gold standard in the diagnosis of HPV. Among them, there are the techniques of Polymerase Chain Reaction (PCR), Hybrid Capture and *In Situ* Hybridization⁽¹²⁾.

Several studies, conducted in order to compare the Pap test to molecular hybridization test (HPV-DNA), showed a concordance between the techniques that ranged from 48% to 75%, depending on the cytologic criteria. Meta-analysis, conducted in 28 studies, found average sensitivity of 58% and mean specificity of 69% for Pap test; however, there were serious limitations to the examination as HPV diagnostic tool in populations with high prevalence of cervical intraepithelial neoplasia (CIN)^(16,17). Researches have shown the superiority of molecular biology techniques in relation to other methods, with prevalence of HPV ranging 67-98% among HIV-infected women^(18,19).

Although the prevalence of HPV may vary depending on the detection method used, in this sample, 15.6% of women had cell changes suggestive of HPV action. This finding approaches the results of researches of Faria *et al.*⁽¹⁹⁾ and Campos *et al.*⁽¹⁷⁾, which found a prevalence of 15.8% and 17.5%, respectively, also in HIV-positive women and based on the examination of conventional cytology (Pap test). In cytological results, works such as Franco *et al.*⁽²⁰⁾ and Roberts *et al.*⁽²¹⁾ reported a false-negative rate of around 5% to 70%, and the existence of disagreement between different cytologists around 10% to 80%.

Because of the possibility of false-negative results in Pap test and the specific characteristics of the infection, the Ministry of Health recommends the examination for women with HIV in shorter periods than women in general. It indicates the Papanicolaou after initial diagnosis of HIV and, in case of negative result, it must be repeated after six months. If the absence of cervical intraepithelial neoplasia is maintained, it is necessary to annually repeat the test. Only the carriers of abnormality to the Pap test should be referred for colposcopy and directed biopsy⁽⁸⁾.

Thus, the screening of women with HIV should be considered a special situation because, due to the failure in the immune system, they have an increased risk for the development of precursor lesions of cervical cancer. Viral replication can be more efficient in immunocompromised individuals, contributing to higher detection rates and viral persistence, with more severe histopathologic lesions, cervical involvement more extensive and more likely to reach other organs of the lower genital tract^(11,22).

Women infected by this virus are approximately five times more likely to develop cervical squamous intraepithelial lesions that precede invasive cancer. This is three times more frequent in women infected with HIV compared to uninfected women^(23,24).

Among the women with positive result for HPV in this study, all of them had cervical intraepithelial lesion, being low-degree lesions or LSIL the most frequent. However, even when dealing with milder injuries, it should be considered that HIV-infected women have lower rates of regression of intraepithelial lesions of low degree and a higher risk of progression of these lesions, particularly those with a low CD4 lymphocyte count⁽²⁵⁾.

The local and systemic immunity is, therefore, considered a determining factor for the development of persistent primary infection, which is the most important risk factor for

cervical neoplasia⁽²⁶⁾. In this regard, CD4 + cells count has wide clinical use as a general marker for immunocompetence. Its depletion indicates severe deficiency in cellular immunity and increased risk, not only of persistent infection, but of infection and increased aggressiveness of HPV in HIV-positive women⁽²⁷⁾.

A prospective study of Palefsky *et al.*⁽²⁸⁾, with women infected with HIV and HPV, found greater incidence of HPV in women with CD4 count lower than 200 cells/mm. In our study, we found an inverse situation, that is, the majority of women diagnosed with HPV (80%) had, at their last examination, CD4 + count in limits above 200 cells/mm. However, it should be noticed that among all women in the sample of the study, only two (6.3%) had severe immunosuppression, which is probably due to non-adherence to antiretroviral therapy, which has shown a protective effect for progression and recurrence of cervical intraepithelial lesions because of its immunity restorative effect⁽²⁹⁾.

HPV infection, as discussed, is an important risk factor for the development of pre-neoplastic and neoplastic lesions of the cervix and with a greater chance of development in HIV-positive women⁽²²⁾, which is, therefore, a necessary condition, but not sufficient since, besides deficient immune status, other factors favor the development of cervical cancer, which should be taken into consideration. Among them, there is the low socioeconomic status, age, early first sexual intercourse, the multiplicity of sexual partners, history of sexually transmitted diseases, among others⁽³⁰⁾.

In this study, the social-demographic profile of women with HIV/AIDS follows the evolution of the characteristics of the population affected by the disease in Brazil, that is, young women, married or in a stable relationship, with low education and income, who initiated their sexual life early and who were infected through sexual contact, being these findings similar to the studies of Galvão *et al.*⁽³⁰⁾ and Machado *et al.*⁽²⁾. It is observed that these characteristics are confused with risk factors for acquiring HPV and developing cervical cancer, which makes predictable the association between these disorders.

Regarding age, the literature points out that the incidence of cervical cancer increases in women between 30 and 39 years, reaching its peak in the fifth or sixth decades of life⁽³¹⁾. This study showed that most HIV-positive women are in this age group, which, therefore, implies a greater attention from health professionals.

Studies point out that the unfavorable social and economic position of women, which was observed in this study by family income and low education, make them more vulnerable to HIV and other STDs because of the difficulty of access to goods and services, such as education, employment health and adequate care^(5,30,32). The inequalities of power between the genders also contribute to greater female vulnerability. Male and female roles culturally established interfere in decisions about prevention, and many women are prevented from negotiating condom use, discussing fidelity and breaking up risky relationships. This social and gender inequality also interferes in the acquisition of information, giving strength to beliefs and various attitudes around preservatives, that it reduces the pleasure or inhibit sexual performance^(33,34).

While most women in this study refer to a single sexual partner in the last year, it is observed that a significant portion had four or more partners over a lifetime and that

none of them had regular condom use before diagnosis of HIV infection, which can be seen in Table II. This fact suggests that sexual intercourse was the probable way of infection of these women and that gender inequalities, although beyond the objectives of this study, probably contributed to this reality. The multiplicity of sexual partners in life and promiscuous sexual partner are also important risk factors for HPV infection and other STDs, which is, therefore, another factor that favors the development of cervical cancer^(35,36).

It was also found that, even after diagnosis of HIV, some women did not adhere to the condom. According to the literature, both women and men living with HIV are at risk of reinfection when not using protection during sexual intercourse, and may be infected with different strains of HIV, which may accelerate the progression of the disease. For this reason, it is important to emphasize that, even among seroconcordant couples, using condom is indispensable⁽⁹⁾. It is noteworthy that, in these cases, besides the risk of reinfection with HIV, there is risk of other STDs, such as HPV infection. Prospective studies suggest that half of HPV infections in HIV-positive women are sexually acquired in a recent period, while the other half is the reactivation of previously acquired infections⁽³⁷⁾.

Another fact that deserves discussion relates to the early onset of sexual activity. In this study, it was observed that most women started sexual activity in adolescence, younger than 17 years (62.5%). The early onset of sexual activity increases the risk for infection by HPV and, consequently, the risk of cervical intraepithelial neoplasia. The emergence of malignant intraepithelial lesions can progress more rapidly in young women because of the immaturity of the cervix, due to the phase transformation of squamous epithelium by the metaplasia process⁽³⁸⁾.

The implications of these findings for clinical follow-up are that HIV-positive women, regardless of the severity of HPV-induced lesions or presence of HPV co-infection, should undergo more detailed gynecological evaluation⁽²³⁾, carefully investigating other risk factors involved in carcinogenesis of the cervix, as well as co-infection with HPV.

CONCLUSION

In this study, the prevalence of HPV found among HIV-positive women was 15.6%, similar to other studies that also used conventional cytology (Papanicolaou) as a diagnostic method. It was observed that all women with HPV had intraepithelial lesions in the cervix, with a predominance of low-degree lesions. Other risk factors that predispose the development of cervical cancer were also identified in the study population, such as age, low education and income, early first sexual intercourse and irregular use of condoms. The results of this study demonstrate, thus, the need for regular gynecological monitoring for women living with HIV, with warranty, through health services, to the realization of the Pap test, avoiding, thus, cervical cancer in the studied population.

REFERENCES

1. Trottier H, Franco E. The epidemiology of genital human papillomavirus infection. *Vaccine*. 2006;24(supl.1):1-15.
2. Machado MFAS, Araújo MAL, Mendonça LMC, Silva DMA. Comportamento sexual de mulheres com papiloma vírus humano em serviços de referência de fortaleza, ceará. *RBPS, Fortaleza, Jan./mar. 2010;23(1): 43-47.*

3. Brasil. Ministério da Saúde. Departamento de Atenção Básica. Cadernos de Atenção Básica. Controle dos Cânceres do Colo do Útero e da Mama. 2ª edição, nº 13 Brasília – DF 2013.
4. Aidé S, Almeida G, Val I, Vespa Junior N, Campaner AB. Neoplasia Intraepitelial Cervical. DST - J bras Doenças Sex Transm. 2009; 21(4):166-170.
5. Fedrizzi EN, Laureano JK, Schlup C, Campos MO, Menezes ME. Infecção pelo Papilomavírus Humano (HPV) em Mulheres HIV-Positivo de Florianópolis, Santa Catarina. DST - J bras Doenças Sex Transm. 2011;23(4):205-209.
6. CDC. Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR. 1993;41:1-20.
7. Rosenthal RM, Silveira MF, Brum VMA. Associação Entre Índice de Células CD4 e Alterações Ginecológicas em Mulheres HIV-Positivo. DST – J bras Doenças Sex Transm. 2008;20(2):104-10.
8. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Programa Nacional de DST e Aids. Manual de Controle Doenças Sexualmente Transmissíveis DST Série Manuais nº 68. 4a edição. Brasília (DF), 2006.
9. Brasil. Ministério da Saúde. Departamento de Atenção Básica. Saúde sexual e Saúde reprodutiva Cadernos de Atenção Básica, nº 26. 1. ed., 1. reimpr. Brasília (DF), 2013.
10. Osis MJD, Duarte GA, Sousa MH. Conhecimento e atitude de usuários do SUS sobre o HPV e as vacinas disponíveis no Brasil. Rev Saúde Pública 2014;48(1):123-133.
11. Inca. Instituto Nacional do Câncer. Diretrizes Brasileiras para o Rastreamento do Câncer do Colo do Útero. Rio de Janeiro: INCA, 2011. Disponível em: http://www1.inca.gov.br/inca/Arquivos/Titulos/Nomenclatura_colo_do_uterio.pdf. Acesso em: 24 ago. 2014.
12. Bringhenti MEZ, Dozza TG, Dozza TG, Martins TR, Bazzo ML. Prevenção do Câncer Cervical: associação da citologia oncótica a novas técnicas de Biologia Molecular na detecção do Papilomavírus Humano (HPV). DST - J bras Doenças Sex Transm. 2010;22(3):135-140.
13. Pias AA, Vargas VRA. Controle externo da qualidade dos diagnósticos citológicos no rastreamento do câncer cervical: estudo piloto. Rev Bras Anal Clin. 2009;41(2):155-160.
14. Lorincz AT. Human papillomavirus detection tests. In: Holmes KK, Mardh PA, Sparlig PF, Wiemer PJ, editors. Sexually transmitted diseases. New York: McGraw-Hill; 1990. p. 953-9.
15. Amaral RG, Souza NLA, Tavares SBN, Manrique, EJC, Assem DZ, Azevedo LL, et al. Controle externo da qualidade dos diagnósticos citológicos no rastreamento do câncer cervical: estudo piloto. Rev Bras Anal Clin. 2006;38(2):79-81.
16. Morse AR, Wickenden C, Byrne M, Taylor-Robinson D, Smith J, Anderson MC, et al. DNA hybridisation of cervical scrapes. J Clin Pathol. 1988;41(3):291-294.
17. Campos RR, Melo VH, Castilho DM, Nogueira CPF. Prevalência do papilomavírus humano e seus genótipos em mulheres portadoras e não-portadoras do vírus da imunodeficiência humana. Rev Bras Ginecol Obstet. 2005;27(5):248-56.
18. Rocha GA, Melo VH. Biologia molecular no rastreamento das neoplasias cervicais uterinas. FEMINA. 2010;38(3):167-172.
19. Faria IM, Melo VH, Castro LPF, Faria FM, Carvalho NO, Araújo ACL, Oliveira HC. Acuidade da citologia oncótica para o diagnóstico da infecção pelo HPV no colo uterino de mulheres portadoras do HIV. Rev Bras Ginecol Obstet. 2008;30(9):437-44.
20. Franco EL, Duarte-Franco E, Ferenczy A. Prospects for controlling cervical cancer at the turn of the century. Salud Pública de México. 2003;45(supl.3):367-375.
21. Roberts CC, Tadesse AS, Sands J, Halvorsen T, Schofield TL, Dalen A, et al.

- Detection of HPV in Norwegian cervical biopsy specimens with type-specific PCR and reverse line blot assays. *J Clin Virol.* 2006;36(4): 277-282.
22. Vaz LP, Saddi VA, Amaral WN, Manoel WJ. Epidemiologia da infecção pelo HPV em mulheres infectadas pelo HIV. *FEMINA.* 2011;39(1):35-40.
23. Beskow AH, Engelmark MT, Magnusson JJ. Interaction of host and viral risk factors for development of cervical carcinoma in situ. *Int J Cancer.* 2005;117(4): 690-2.
24. Ellerbrock TV, Chiasson MA, Bush TJ, Sun X, Brudney K, Wright TC. Incidência de lesões escamosas intra-epiteliais cervicais em mulheres infectadas pelo HIV. *JAMA Brasil.* 2000;4(5):3124-38. 18
25. Duerr A, Paramsothy P, Jamieson DJ, Heilig CM, Klein RS, Cu-Uvin S, *et al.* Effect of HIV infection on atypical squamous cells of undetermined significance. *Clin Infect Dis.* 2006;42(6):855-61.
26. Massad LS, Seaberg EC, Watts DH, Minkoff H, Levine AM, Henry D, *et al.* Longterm incidence of cervical cancer in women with human immunodeficiency virus. *Cancer.* 2009;115(3):524-30.
27. Coelho RA, Facundo MKF, Nogueira AL, Sakano CRSB, Ribalta JCL, Baracat EC. Relação entre diagnóstico citopatológico de Neoplasia Intra-Epitelial Cervical e índices de células CD4+ e de carga viral em pacientes HIV-Soropositivas. *Rev Bras Ginecol Obstet.* 2004;26(2):97-102.
28. Palefsky JM. HPV infection and HPV-associated neoplasia in immunocompromised women. *Int J Gynaecol Obstet.* 2006;94(1):6-64.
29. Monini P, Sgadai C, Toschi E, Barillari G, Ensoli B. Antitumor effects of antiretroviral therapy. *Nat Rev Cancer.* 2004;4(11):861-75.
30. Galvão MTG, Freitas JG, Costa E, Lima ICV, Brito DMS, Diógenes MAR. Mulheres com HIV: Características individuais e da prevenção de câncer cervical. *Rev Rene.* 2010;11(n. esp.):99-108.
31. World Health Organization. Cancer Control. Knowledge into action. WHO guide for effective programmes. Switzerland: WHO, 2007
32. Silva LMS, Moura MAV, Pereira MLD. Cotidiano de mulheres após contágio pelo HIV/AIDS: subsídios norteadores da assistência de enfermagem. *Texto Contexto Enferm.* 2013;22(2):335-42.
33. Maia C, Guilhem D, Freitas D. Vulnerabilidade ao HIV/Aids de pessoas heterossexuais casadas ou em união estável. *Rev Saúde Pública.* 2008;42(2):242-8.
34. Chaves ACP, Bezerra EO, Pereira MLD, Wolfgang W. Conhecimentos e atitudes de adolescentes de uma escola pública sobre a transmissão sexual do HIV. *Rev Bras Enferm.* 2014;67(1): 48-53.
35. Brito DMS, Galvão MTG. Fatores de risco para Câncer de Colo Uterino em mulheres com HIV. *Rev Rene.* 2010;11(1):191-199.
36. Azevedo VNG, Dias Junior LB, Denachki S, Lima FAS. Frequência das neoplasias intra-epiteliais cervicais em mulheres portadoras do vírus imunodeficiência humana adquirida. *Rev Para Med.* 2006;20(2):35-9.
37. Strickler HD, Burk RD, Fazarri M, Anastos K, Minkoff H, Massad LS, *et al.* Natural History and possible reactivation of human papillomavirus in human immunodeficiency virus-positive women. *J Natl Cancer Inst.* 2005;97(8):577-86.
38. Borges SCV, Melo VH, Moroza Júnior G, Abranches A, Lira Neto JB, Trigueiro MC. Taxa de detecção do papilomavirus humano pela captura híbrida II, em mulheres com neoplasia intra-epitelial cervical. *Rev Bras Ginecol Obstet.* 2004; 26(2):105-10.

Received: March 4, 2015; Accepted: May 26, 2015

ISSN 1695-6141

© [COPYRIGHT](#) Servicio de Publicaciones - Universidad de Murcia