

To Study The Prevalence of HPV Genome in HIV Positive Women in Comparison to HIV Negative Women in India.

Navneet Kaur¹, Surinder Kaur²

¹Associate Professor, Department of Pathology, Government Medical College, Patiala.

²Junior Resident, Department of Pathology, Government Medical College, Patiala.

Received: March 2019

Accepted: March 2019

Copyright: © the author(s), publisher. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Cervical cancer is the second most common cancer among women worldwide. Infection with the Human Immunodeficiency Virus (HIV) is associated with an increased risk of prevalence of HPV. Cervical cancer is most common in age group 45-55 years. The various risk factors include age at first intercourse, multiple sexual partners, use of oral contraceptives pills, parity, family history, associated genital infections, and immunosuppression etc. Sexually transmitted human papilloma virus (HPV) infection is the most important risk factor for cervical intraepithelial neoplasia and invasive cervical cancer. **Objective:** To study the prevalence of HPV in the study group comprising of 100 HIV positive women and 100 HIV negative women. **Methods:** The present study was conducted in the department of Pathology, GMC, Patiala on 100 cervical brushings prepared from HIV positive patients attending ART Centre and 100 HIV negative females at GMC and Rajindra hospital, Patiala. The cervical brushings were analysed in the Department of Pathology, Government Medical College Patiala. HPV detection was done on samples of cervical brushings. **Results:** In the 200 cases studied, 74 cases were positive for HPV infection. Out of 74 cases, 51 (51%) cases were HIV positive and 23 (23%) cases were HIV negative. **Conclusion:** It was seen that prevalence of HPV was higher in HIV positive cases as compared to HIV negative cases.

Keywords: HIV, HPV.

INTRODUCTION

Infection with the Human Immunodeficiency Virus (HIV) is associated with an increased risk of prevalence of HPV.^[1] The various risk factors include age at first intercourse, multiple sexual partners, use of oral contraceptives pills, parity, family history, associated genital infections, and immunosuppression etc.^[2] Sexually transmitted human papilloma virus (HPV) infection is the most important risk factor for cervical intraepithelial neoplasia and invasive cervical cancer.^[3]

Human papillomavirus (HPV), a common sexually transmitted virus, is a necessary cause of invasive cervical cancer (ICC). While the vast majority of cervical HPV infections clear or become undetectable, these infections persist in a subset of women. HIV-infected women are significantly more likely than HIV-uninfected women to have incident and persistent HPV cervical infections, and to develop incident pre-cancers such as squamous intraepithelial lesions (SIL), including high-grade

SIL (HSIL). Among HIV-infected women the incidence of HPV infection and SIL increases with lower CD4+ T-cell count (CD4). These collective findings strongly support a dose-response relationship between host immune status and the risk of early and intermediate stages of HPV-related tumorigenesis.^[4]

Because both HIV infection and HPV infection are sexually transmitted, the 2 infections are often found together. In addition, as a result of HIV-induced immune impairment, there is also an increased probability that HPV infection will become persistent in HIV-infected women and evolve into precancerous and cancerous lesions of the cervix uteri. As expected, the relative risk of invasive cervical cancer among women living with HIV infection varies from country to country on the basis of the extent to which premature death due to other causes or early detection of cancer prevents progression of preinvasive lesions to the invasive stage.^[5] Of the many types of human papillomavirus (HPV), more than 30 infect the genital tract. The association between certain oncogenic (high-risk) strains of HPV and cervical cancer is well established.^[6]

Name & Address of Corresponding Author

Dr. Navneet Kaur
Associate Professor,
Department of Pathology,
Government Medical College,
Sangrur Road, Patiala – 147001.

Kaur & Kaur; To Study The Prevalence of HPV Genome in HIV Positive Women in Comparison to HIV Negative Women in India

MATERIALS AND METHODS

The present study was conducted in the department of Pathology, GMC, Patiala on 100 cervical brushings prepared from HIV positive patients attending ART Centre and 100 HIV negative females attending Gynaecology OPD at GMC and Rajindra hospital, Patiala. The cervical brushings were analysed in Department of Pathology, Government Medical College Patiala

HPV DNA Detection^[7]

Cervical Brush Specimen Collection

1. BD Onclarity HPV Cervical Brush is inserted into the endocervix until only the bottom most bristles are exposed at the os. Slowly rotate ¼ to ½ turn in one direction. To reduce unnecessary bleeding, do not over-rotate the brush.
2. Remove cap from the BD Onclarity HPV Cervical Brush Diluent tube and immediately place the brush into the bottom of the tube.
3. Carefully break the shaft at the score line. Avoid splashing of the contents.
4. Tightly recap the tube.

Principles of the Procedure

The BD Onclarity Human Papillomavirus (HPV) Assay is designed for use with the BD Sure Path Preservative Fluid, the BD Onclarity HPV Cervical

Brush Collection Kit, applicable reagents, the BD Viper LT System and BD FOX™ Extraction.

Specimens had undergone a pre-warm step in the BD Pre-warm Heater to homogenized the matrix, lysed cells, and released DNA capable of being extracted and amplified. After cooling, the specimens were loaded onto the BD Viper LT System which then performed all the steps involved in extraction and amplification of target DNA, without further user intervention

The BD Onclarity HPV Assay is performed with the BD Viper™ LT System. The assay detected all high risk HPV types (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, and 68) and provided the capability for genotyping of six high risk types (HPV 16, 18, 31, 45, 51 and 52) and other high-risk genotypes reported by genotype group (P1: 33/58; P2: 56/59/66; P3: 35/39/68).

RESULTS

Out of 100 HIV positive cases, majority of cases i.e. 59 (59%) were reported in 30-45 years of age group followed by 27 (27%) cases in 46-60 years of age, 9 (9%) cases were <30 years old and 5 (5%) cases in >60 years of age.

Table 1: HIV Status According To Age

Age Groups (in years)	HIV Positive		HIV Negative	
	No. of Patients	Percentage	No. of Patients	Percentage
<30	9	9%	5	5%
30-45	59	59%	59	59%
46-60	27	27%	28	28%
>60	5	5%	8	8%
Total	100	100%	100	100%

Out of 100 HIV negative cases, majority of cases i.e. 59 (59%) were reported in 30-45 years of age group followed by 28 (28%) cases in 46-60 years of age group, 8 (8%) cases in >60 years and 8 (8%) cases in <30 years age group. [Table 1]

In the present study, Prevalence of HPV in HIV positive cases was found to be 51% whereas in HIV negative cases it was 23%. HPV prevalence was higher in HIV positive cases than HIV negative cases. [Figure 1]

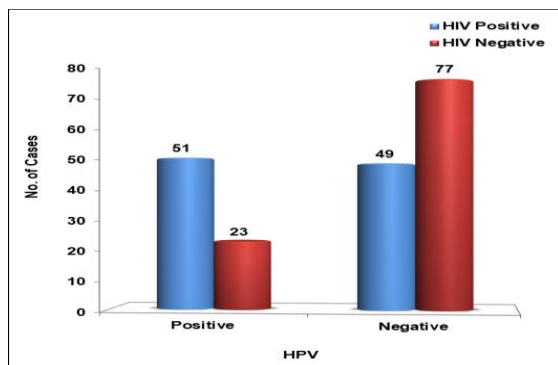


Figure 1: Comparison of Prevalence of HPV According to HIV Status

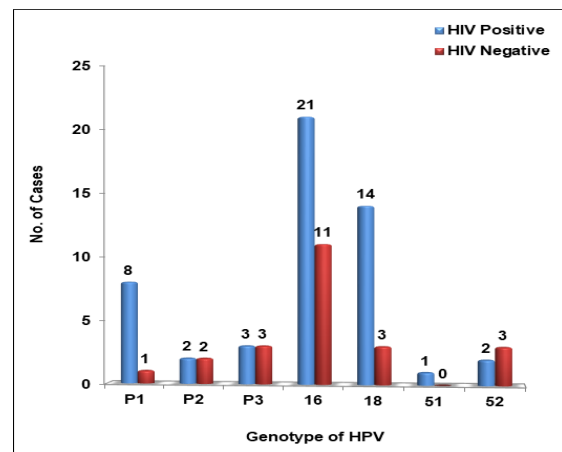


Figure 2: Comparison of Genotype of HPV According to HIV Status

Out of 74 HPV positive cases, HPV 16 and 18 were present in 32 (43.24%) cases and 17 (22.97%) cases respectively, followed by 9 (12.16%) cases of P1. There were 6 (8.11%) cases of P3, 5 (6.76%) cases of HPV 52, 4 (5.41%) cases of P2 and only a single case (1.35%) of HPV 51. The most common types of

HPV detected were HPV 16 and 18 in both HIV positive and HIV negative patients. [Figure 2].

DISCUSSION

The present study was conducted in the Department of Pathology and a total of 200 patients were included. Out of 200 patients, 100 were HIV positive on ART from ART centre and other 100 HIV negative cases were those who presented in Gynaecology outdoor. In the present study, samples of cervical brushings were taken from 200 patients. The cervical brushings were analysed in the Department of Pathology, Government Medical College Patiala and HPV detection was done on samples of cervical brushings.

In the present study prevalence of HPV in HIV positive females was found to be 51% which is similar to the results of the studies conducted by Sun et al.^[8] (1995) showing HPV positivity in 60% and Motti et al.^[9] (1996) showing HPV positivity in 60% cases. Blossom et al.^[10] (2007) and Dartel et al.^[11] (2012) observed similar results showing prevalence of HPV in HIV positive cases as 46.2% and 47.8% respectively. Miranda et al.^[12] (2017) and Teixeira et al.^[13] (2018) observed prevalence of HPV in HIV positive cases as 28.4% and 31.1% respectively. This discrepancy would be explained because of variation in sample size, age group distribution, socio-economic status, education level and geographic distribution.

In the present study prevalence of HPV in HIV negative cases was 23%. In the study conducted by Motti et al.^[9] (1996) and Branca et al.^[14] (2003) HPV positivity in HIV negative cases was 23% and 22.8% respectively. The results of the present study correlate with the above mentioned studies.

CONCLUSION

The most common types of HPV detected were HPV 16 and 18. HPV infection is highly prevalent in HIV positive women and a major risk factor for the cervical abnormalities and therefore its detection and prevention can decrease the incidence of cervical abnormalities.

REFERENCES

1. Memiah P, Makokha V, Mbutia W, Kiiru GW, Agbor S, Odhiambo F, et al. Epidemiology of Cervical Squamous Intraepithelial Lesions in HIV Infected Women in Kenya: a cross-Sectional Study, *Afr J Reprod Health* 2015;19(1):133-9.
2. Kumar P, Malhotra N. Jeffocate's Principles of Gynaecology. (7th edn.) New Delhi: Jaypee publishers; 2008;467-9.
3. Schiffman M, Castle PE, Jeronimo J, Rodriguez AC, Wacholder S. Human papillomavirus and cervical cancer. *The Lancet*. 2007;370(9590):890-907.
4. Abraham AG, Strickler HD, Jing Y, Gange SJ, Sterling TR, Silverberg M et al. Invasive cervical cancer risk among HIV-infected women: a North American multi-cohort collaboration

- prospectively. *Journal of acquired immune deficiency syndromes* (1999). 2013;62(4):405-13.
6. Franceschi S, Jaffe H. Cervical cancer screening of women living with HIV infection: a must in the era of antiretroviral therapy. *Clinical infectious diseases*. 2007;45(4):510-3
7. Walboomers JM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *The Journal of pathology*. 1999;189(1):12-9.
8. BD Viper LT System User's Manual. Available from : [http://legacy.bd.com/ds/technicalCenter/inserts/500005363\(02\).pdf](http://legacy.bd.com/ds/technicalCenter/inserts/500005363(02).pdf)
9. Sun XW, Ellerbrock TV, Lungu O, Chiasson MA. Human papillomavirus infection in human immunodeficiency virus-seropositive women. *Obstet Gynecol*. 1995;85(5 Pt 1):680-6.
10. Motti PG, Dallabetta GA, Daniel RW, Canner JK. Cervical abnormalities, human papillomavirus, and human immunodeficiency virus infections in women in Malawi. *J Infect Dis*. 1996;173(3):714-7.
11. Blossom DB, Beigi RH, Farrell JJ, Mackay W, Qadadri B, Brown DR et al. Human papillomavirus genotypes associated with cervical cytologic abnormalities and HIV infection in Ugandan women. *Journal of medical virology*. 2007;79(6):758-65.
12. Dartell M, Rasch V, Kahesa C, Mwaiselage J, Ngoma T, Junge J et al. Human papillomavirus prevalence and type distribution in 3603 HIV-positive and HIV-negative women in the general population of Tanzania: the PROTECT study. *Sexually transmitted diseases*. 2012;39(3):201-8.
13. Miranda AE, Silveira MF, Travassos AG, Tenório T, Val IC, Lannoy L, Mattos Junior HS, Carvalho NS. High-risk papillomavirus infection among women living with human Immunodeficiency virus: Brazilian multicentric study. *Journal of medical virology*. 2017;89(12):2217-23.
14. Teixeira MF, Sabidó M, Leturiondo AL, de Oliveira Ferreira C, Torres KL, Benzaken AS. High risk human papillomavirus prevalence and genotype distribution among women infected with HIV in Manaus, Amazonas. *Virology journal*. 2018;15(1):36.
15. Branca M, Garbuglia AR, Benedetto A, Cappiello T, Leoncini L, Migliore G et al. Factors predicting the persistence of genital human papillomavirus infections and PAP smear abnormality in HIV-positive and HIV-negative women during prospective follow-up. *International journal of STD & AIDS*. 2003;14(6):417-25.

How to cite this article: Kaur N, Kaur S. To Study The Prevalence of HPV Genome in HIV Positive Women in Comparison to HIV Negative Women in India. *Ann. Int. Med. Den. Res.* 2019; 5(3):PT25-PT27.

Source of Support: Nil, **Conflict of Interest:** None declared