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Factors Affecting Human Papillomavirus Infection in Women of Reproductive Age

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Abstract: General Background: Human papillomavirus (HPV) is a prevalent sexually transmitted infection and a major cause of cervical cancer, affecting millions worldwide. Developing countries bear the highest burden, with HPV-linked cancers significantly impacting women's health. Specific Background: HPV infection often remains asymptomatic but can lead to severe oncogenic transformations. Despite extensive research on HPV epidemiology, gaps remain in identifying high-risk groups and establishing effective early diagnostic methods. Knowledge Gap: While existing studies highlight HPV prevalence, limited research focuses on demographic variations and risk factors among women in Uzbekistan. Aims: This study aims to determine early diagnostic methods for HPV and assess its prevalence among women of reproductive age, considering associated oncogenic risks. Results: The study analyzed 133 women presenting with specific gynecological symptoms. Findings revealed that women aged 36–55 were 3.8 and 9.4 times more likely to have HPV than younger (19–35) and older (>56) women, respectively. Additionally, HPV prevalence was significantly higher among married women, comprising 90.2% of cases. Novelty: This research provides new insights into age and marital status as key risk factors for HPV infection, emphasizing the need for targeted diagnostic and preventive strategies. Implications: The findings underscore the

necessity of implementing comprehensive HPV screening programs, particularly for high-risk age groups, to mitigate oncogenic risks and enhance women's health outcomes.

Keywords: OPV infection, women of reproductive age, ELISA analysis, polymerase chain reaction

INTRODUCTION

Human papillomavirus (HPV) is an infection that primarily affects mucosal surfaces, as well as many skin tissues, and is a cancer-causing virus (Hirt J., 2019; Kobayashi K., 2018).[1] According to WHO data, nearly 500,000 new cases of cervical cancer are registered worldwide each year. Additionally, currently, over 660 million people are HPV carriers. However, approximately 85% of HPV cases occur in developing countries, with 12% of diagnosed cancer cases observed in women (Nejo Y.T. et al., 2020). HPV is the most common sexually transmitted infection worldwide and is responsible for nearly all cases of cervical cancer (Hausen H., 2022). Currently, more than 600 types of HPV have been identified in humans. Of the 200 known types of HPV, approximately 40 affect the anogenital mucosa and are referred to as 'genital types of HPV' (Doorbar J., 2023). [2]

In some cases, the infection may be asymptomatic, but certain types of HPV, if persistent, can lead to cervical cancer (CC), vaginal and vulvar cancer, penile cancer, as well as anal, oropharyngeal, and other types of cancer in both women and men (Saraiya M., 2019). Other types of HPV (commonly types 6 and 11) cause anogenital warts. The virus is responsible for 100% of cervical cancer cases, 90% of colorectal cancer cases, 40% of vulvar and vaginal cancers, approximately 12% of oropharyngeal cancers, and up to 3% of oral cavity cancers (Saraiya M., Unger ER, Tompson T.D., 2021).[3]

The aim of our research is to identify an early diagnostic method and determine the frequency of occurrence, considering the risk of pathological changes in oncogenic tissues caused by HPV infection.[4]

Materials and methods: Our study selected 133 women over the age of 19 who came to the multi-specialty central polyclinic in the Yunusabad district of Tashkent with complaints such as discharge of mucus, pus, odor, and frothy discharge.

Additionally, 30 women were included as a control group. All the women included in the study had their discharges brought to the Virology Research Laboratory of the Republican Specialized Center for Epidemiology, Microbiology, Infectious and Parasitic Diseases for scientific examination.

The study used enzyme-linked ELISA, polymerase chain reaction (PCR), hybridization-luminescent detection AmpliSens® HPV PCR screening-titr-FL (produced by Interlab Service LLC, Russia), Papanicolaou (Pap) test and statistical methods. Urine samples were collected from the women in our study for laboratory tests.[5]

Results and Discussion: The following findings were identified in the women in our study.

For our study, 133 women were selected for the main group and were divided into the following groups according to the World Health Organization's classification of modern age groups.

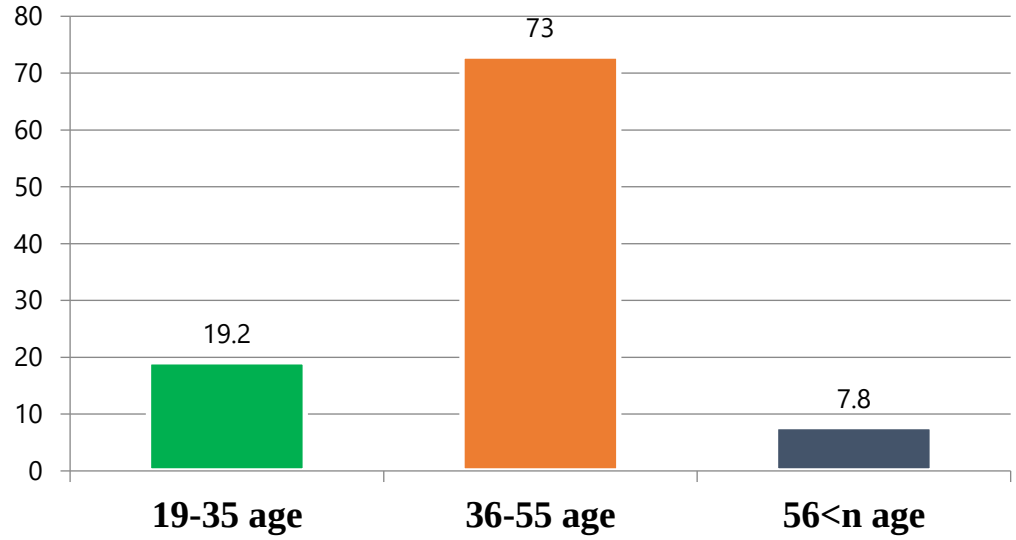

Figure 1. Age distribution of women in the main group of our study (n=133).

As seen in Figure 1, there were 26 women aged 19-35, 97 women aged 36-55, and 10 women aged 56 and older. From the above data, it is evident that the highest number of cases were found in women aged 36-55. [6]

Table 1 Distribution of the marital status of patients in the main group (abs., %)

Age groups	Total number	Main group		Control group	
		abs.	%	abs.	%
19-35	33	26	15,9	7	4,3
36-55	111	97	59,6	14	8.6
56<n	19	10	6,1	9	5,5
Total:	**163**	**133**	**81,6**	**30**	**18,4**

As seen in Table 1, among all the women in our study (n=163), 33 women (20.2%) were aged 19-35, 111 women (68.1%) were aged 36-55, and 19 women (11.6%) were aged 56 and older. The analysis by age shows that women aged 36-55 were 4.5 times more likely to present with the complaints mentioned above compared to women aged 19-35, and 9 times more likely compared to women aged 56 and older. The difference in these indicators was proven to be statistically significant (P<0.001).[7]

A total of 30 women who only reported mucus discharge came under observation in the control group. They were also studied by age group. As seen in Table 3.1, 7 women in the control group were aged 19-35, 14 women were aged 36-55, constituting 46.7% of all women in the control group, and 9 women (30%) were aged 56 and older.

From the above data, it is evident that the incidence of disease is higher among women aged 36-55 in both the main and control groups.

The marital status of women in the main and control groups in our study was also examined, and the following results were identified.

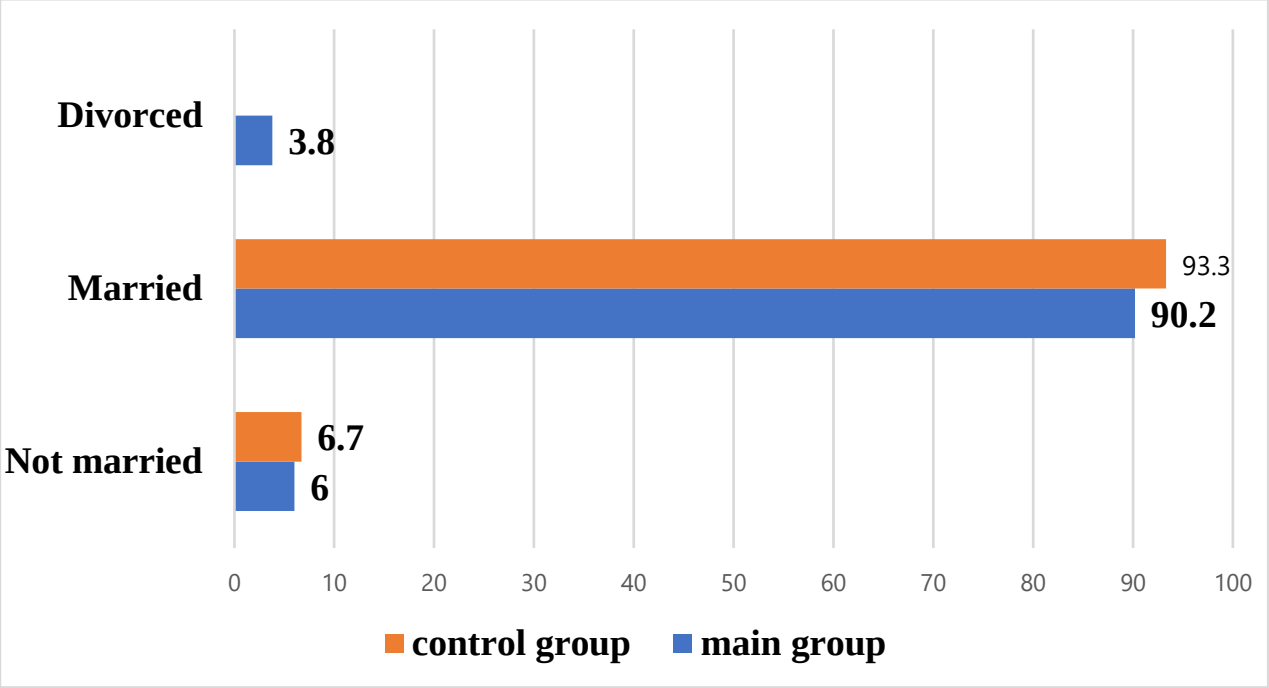

Figure 2. Marital status of women in the main and control groups of our study (*-P<0.05)

As seen in Figure 2, married women predominated with the highest percentage in both the main and control groups (90.2% and 93.3%, respectively). Unmarried women were nearly twice as prevalent in the control group compared to the main group (6.7% and 3.8%, respectively). However, it was found that only women in the main group were divorced, and they accounted for 6%. The age at which women in the main group got married was examined in our study, and the following findings were identified (P<0.05).[7]

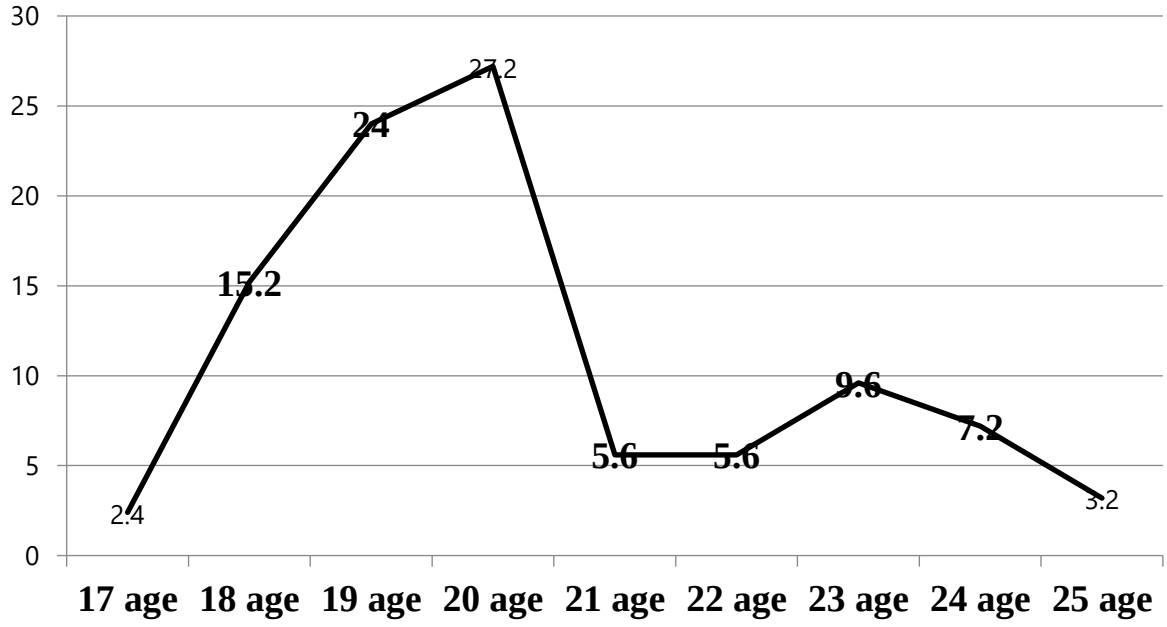

Figure 3. Age at marriage of women in the main group.

As seen in Figure 3, the majority of women in the main group got married at the ages of 18, 19, and 20 (15.2%, 24%, and 27.2%, respectively), while the number of women who married at the age of 23 was nearly three times lower than those who married at 20 (9.6% vs. 27.2%, respectively). The number of women who married at the ages of 17 and 25 was the smallest compared to women who married at other ages (2.4% and 3.2%, respectively).

Out of all 133 women in our study, only 1 woman was found not to have been pregnant during her marriage. Additionally, the number of deliveries among women in the main group was investigated, and the results are presented in Table 3.5.[8]

The number of women who gave birth on the 2nd and 3rd occasions was found to be significantly higher—nearly 2.6, 2.9, and 10.3 times more—compared to those who gave birth on the 1st, 4th, and 5th occasions (28.6%, 39%, 15%, 13.6%, and 3.8%, respectively, P<0.001).

Additionally, the number of abortions these women experienced throughout their lives was investigated.

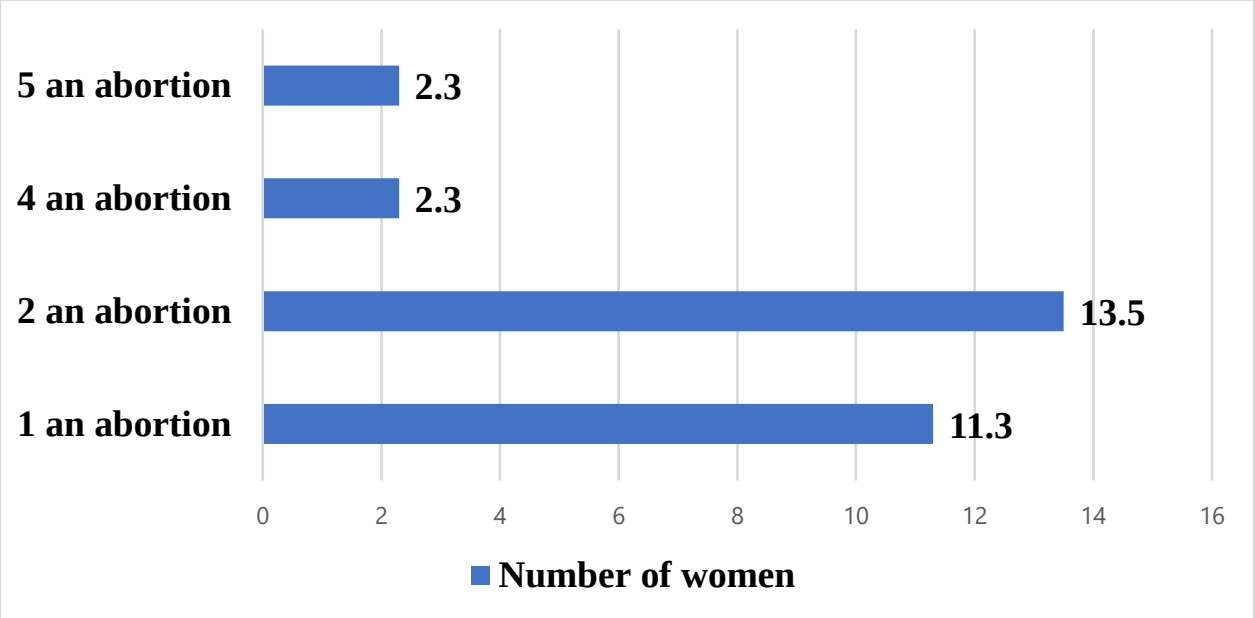

Figure 4. Number of abortions in women's lifetime

As seen in Figure 4, 13.5% of women in the main group of our study had an abortion twice, and 11.3% had an abortion once. However, the number of women who had an abortion four or five times was 2.3%, which is 2.5 times fewer than those who had an abortion once or twice.

The methods used by women in our study from the main group to prevent pregnancy were investigated, and the following results were obtained.[9]

Conclusion: The incidence of HPV infection was found to be 3.8 and 9.4 times higher in women aged 36-55 compared to those aged 19-35 and 56 and older, respectively. It was also proven that the incidence was higher in married women, accounting for 90.2% of the cases.

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