

Human papillomavirus and cervical cancer

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Abstract

Background: According to the World Health Organization, human papillomavirus (HPV) causes cervical cancer, which is the fourth most common cancer in women, with an estimated 266,000 deaths and 528,000 new cases in 2012. Usually, HPV infections cause no symptoms but it is also reported that 99% cervical cancer cases are linked to genital infection with HPV and it is the most common viral infection of the reproductive tract.

Aim: The aim of the study is to review the literature to describe what research has been done and what can be the future prospect.

Methods: To search for the literature search engine, PubMed and Google were searched by inputting different key words, for example, HPV and cervical cancer. Studies considered were broadly associated with either HPV and cervical cancer or its worldwide scenario and socio-economic status.

Results: Considered studies showed that Genital HPV is the most common sexually transmitted infection in the United States, whereas a considerable number i.e., 90% cases of cervical cancer, HPV was detected. The largest proportion attributable to HPV reported were about 75%, 70%, 70% and 60% of vaginal cancers, oropharyngeal cancers, vulvar cancers and penile cancers, respectively. Various identified risk factors as well as different suggested methods are also described to protect against HPV.

Conclusion: We may conclude that as it is sexually transmitted infection and causes no symptoms, so proper care should be taken in intimate hygiene management.

Keywords: Human papillomavirus, cervical cancer, risk factors of cervical cancer, low socio-economic status

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INTRODUCTION

Human papilloma viruses (HPVs) are a small group of nonenveloped viruses belonging to the *Papillomaviridae* family with strong similarities to polyoma viruses.¹⁻⁶ The Center for Disease Control and Prevention highlights the fact that the majority of sexually active individuals become infected with HPV at least once in their lifetime.⁷⁻¹⁰ HPV is the most prevalent sexually transmitted infection worldwide,¹¹⁻¹⁵ associated

with approximately 5.2% of human cancer burden worldwide.¹⁶⁻¹⁸ Types of human papillomavirus (HPV) are phylogenetically classified into alpha (α), beta (β) or gamma (γ) genera, with α-HPVs displaying tropism for mucosal epithelium and β- and γ-HPVs displaying tropism for cutaneous epithelium.^{19,20} Cutaneous HPV types have also been detected in the anal canal, genital, cervical epithelia and in oral and nasal mucosa.²¹⁻³⁰ HPV types 16 and 18 are the most common high-risk types and are considered to be responsible for >70% of all cervical cancer cases.⁵

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METHODS OF REVIEW

For the development purpose of this article different key words in different search engines such as PubMed and Google were searched. Key words used were HPV, cervical cancer, risk factors of cervical cancer, low socio-economic status, etc. Studies included in this review article were broadly associated either with HPV and cervical cancer or with its worldwide scenario and socio-economic status.

RESULTS

Considered studies showed that genital HPV is the most common sexually transmitted infection in the United States, whereas a considerable number i.e., 90% cases of cervical cancer, HPV was detected. The largest proportion attributable to HPV reported were about 75%, 70%, 70% and 60% of vaginal cancers, oropharyngeal cancers, vulvar cancers and penile cancers, respectively. Rates of oropharyngeal squamous cell carcinomas (SCC) were reported amongst 7.6% males than amongst 1.7% of females whereas rates of anal SCC were found amongst 1.8% females than amongst 1.1% males. In South Asia, India has the highest age standardised incidence of cervical cancer at 22 years of age, compared to 19.2 years in Bangladesh, 13 years in Sri Lanka and 2.8 years in Iran. Whereas in India, according to ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre) 2019; 122,844 women were diagnosed with cervical cancer and 67,477 died from the disease. In India, the 5 years prevalence was found to be 1.8 million individuals with cancer which was figured to be 5.52% of global prevalence.

Various risk factors identified are infection with certain oncogenic types of HPVs, sexual intercourse at an early age, multiple sexual partners, multiparity, long-term oral contraceptive use, multiple childbirths, tobacco smoking, low socioeconomic status, infection with Chlamydia trachomatis, micronutrient deficiency and a diet deficient in vegetables and fruits, that contribute to the development of cervical cancer.

Different methods are also suggested to protect against HPV such as sexual abstinence, consistent and correct use of condoms, limiting the number of lifetime sexual partners, cultivating a monogamous relationship and having safe sexual habits. It is also observed that all prophylactic vaccines work through the induction of virus-neutralising antibodies, and reduce the number of cells that are infected after challenge with virus, and so prevent the clinical disease associated with infection. In many African countries, self-reported screening rates were found between 8.3%

and 64%, whereas screening rates were observed ranging between 9.4% and 80% among women accessing HIV care.

DISCUSSION

First, we will discuss worldwide scenario of HPV and its association with cervical cancer, genital HPV is reported to be the most common sexually transmitted infection in the United States with an estimated incidence of 14 million annually.^{11,31-39} According to a study, HPV was detected in about 90% cases of cervical cancers in the United States. From the same study, the largest proportion attributable to HPV were of anal cancers, about 75% of vaginal cancers, followed by about 70% oropharyngeal cancers, an estimated of about 70% vulvar cancers, and about 60% of penile cancers.⁴⁰⁻⁴⁴ Among HPV-attributable cancers, oropharyngeal SCCs were observed the most common from 2009 to 2013.⁴⁵⁻⁵³ Rates of oropharyngeal SCC were found higher among males (7.6%) than females (1.7%) whereas rates of anal SCC were found higher among females (1.8%) than males (1.1%).⁵⁴ In South Asia, India has the highest age standardised incidence of cervical cancer at 22 years of age, compared to 19.2 years in Bangladesh, 13 years in Sri Lanka and 2.8 years in Iran. Whereas in India, according to ICO/IARC Information Centre on HPV and Cancer (HPV Information Centre) 2019; 122,844 women were diagnosed with cervical cancer and 67,477 died from the disease.^{55,56} In India, the 5-year prevalence was found to be 1.8 million individuals with cancer which was figured to be 5.52% of global prevalence.⁵⁷ If we talk about risk factors associated with HPV, some of the risk factors identified by various studies are infection with certain oncogenic types of HPVs, sexual intercourse at an early age, multiple sexual partners, multiparity, long-term oral contraceptive use, multiple childbirths, tobacco smoking, low socioeconomic status, infection with Chlamydia trachomatis, micronutrient deficiency and a diet deficient in vegetables and fruits, that contribute to the development of cervical cancer.^{33,58-61}

Regarding HPV Prevention, numerous studies suggested various methods to protect against HPV such as sexual abstinence, consistent and correct use of condoms,^{7,10} limiting the number of lifetime sexual partners, cultivating a monogamous relationship and having safe sexual habits.⁶² Various studies have reported that viral vaccines that are licensed for use in humans are prophylactic against future challenge with the virus.⁶³⁻⁶⁸ According to Frazer, it is believed that all prophylactic vaccines work through the induction of virus-neutralising antibodies, and markedly reduce the number of cells that are infected after challenge with virus, and so prevent the clinical disease associated

with infection.⁶³ If we put our concentration on vaccination and screening, we came across various studies, reporting that the WHO also recommends the inclusion of HPV vaccination in national immunisation programs provided HPV represents a public health priority and vaccine delivery is feasible and cost-effective.⁶⁹⁻⁷⁴ In another study, screening was found to be another way for early detection and treatment and is a cornerstone of prevention. It is also revealed that early diagnosis and treatment of cervical precancerous lesions prevents up to 80% of cervical cancers in high resource countries where cervical cancer screening is routine.⁷⁵ In a population-based study, conducted in 57 countries in 2008 disclosed that 19% of women in developing countries were screened for cervical cancer in the preceding 3 years.⁷⁶ Although cervical cancer screening are not found available for many African countries, but a number of studies reported self-reported screening rates to be low ranging between 8.3% and 64%.⁷⁷⁻⁷⁹ Screening rates were observed ranging between 9.4% and 80% among women accessing HIV care.⁸⁰⁻⁹¹

On the basis of studies considered, cervical cancer is becoming an epidemic, especially in developing countries. As HPV infections cause no symptoms, it is not easy to identify the disease so to improve the awareness about the disease and virus, government should initiate awareness campaign. As far as further research is concerned, research should be done keeping in view a combination of risk factors, for example, a women who had first cohabitation at early age and has many children, but she does not belong to low socioeconomic status then what would be the probability of getting the disease? Can it be controlled or diagnosed early if any combination of risk factor is taken into consideration?

CONCLUSION

We may conclude that as it is sexually transmitted infection and causes no symptoms, so proper care should be taken in intimate hygiene management.

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Conflicts of interest

There are no conflicts of interest.

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