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A Mini Review on *Human papillomavirus* (HPV)

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Abstract

The *Human Papillomavirus* (HPV) is the common cause for the various cancers like Cervical cancer, vaginal cancer, anal canacer, oropharyngeal cancers. In this review we will get to know what are the different types of HPV, How it will affect the Host, Virology and Nature of HPV, How HPV can be diagnosed and How it can be prevented and treated.

Keywords: Human Papillomavirus; Cervical cancer; Vaginal cancer; Oropharyngeal cancers; Warts

Introduction

Human Papillomavirus is a virus which is available in different strains. These HPV is a group of more than 200 viruses. It is most commonly transmitted through sexual intercourse or other skin-to-skin contact or skin mucous contact. The HPV can be spread by vaginal, anal and oral routes. There are other HPV types which will not cause genital warts and not transmitted through sex. The *Human Papillomavirus* is the cause for cervical cancer. The cervical cancer is the one and only cancer which is caused by the virus. There are more than 40 HPV types which will be transmitted through Sexual Intercourse. These HPV's can be divided into 2 types [1-10]:

1. Low Risk HPV's: These will not cause cancers but can cause skin warts which is technically known as condylomata acuminate formed on or around the genitals and anus. HPV types 6 and 11 will generally cause 90% of genital warts, these also causes recurrent respiratory papillomatosis, which is a rare disease and in this case benign tumours will grow in the air passages leading from the nose and mouth into the lungs.
2. High Risk HPVs': These will cause cancer. Many types of high risk HPV have been identified. Some of them are HPV types 16 and 18, these are responsible for most HPV-caused cancers.

According to Centers for Disease Control and Prevention (CDC), >90% of sexually active men and women will be infected by any type of HPV in their lifetime. Among these half are from high risk HPV type.

Cancers caused by HPV:

The High risk HPV causes the following types of cancers [11-15]:

- Cervical cancer: HPV causes the cervical cancer. 80% of cases are due to HPV 16 & 18 which is mainly responsible for this cervical cancer.

- Anal cancer: 95% of anal cancers are caused by HPV. Most of the cases are due to HPV 16.
- Oropharyngeal cancers: These cancers effects middle part of the throat, soft palate, base of the tongue, and tonsils.
- Other types of cancers: HPV causes 65% of vaginal cancers, 50% of vulvar cancers, and 35% of penile cancers.

For all these types of cancers, HPV type 16 is mainly responsible. Worldwide, approximately 5% of all cancers are caused by these High risk HPV. In United States, this high-risk HPV types cause 3% of cancer cases in women and 2% of cancer cases in men. Sometimes during birth also HPV can be which will cause genital or respiratory system infection to the infant.

170 types of HPV have been identified, and they are recognized by numbers. Some types of HPV, such as HPV-5, may cause infections that will persist for the lifetime without showing any symptoms. HPV types 1 and 2 can cause warts in some infected individuals. Animal warts and respiratory papillomatosis will be caused by HPV types 6 & 11. HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73, and 82 are mostly carcinogenic. The people with less immunity will develop HPV infection faster.

Warts

Skin infection ("cutaneous" disease) with HPV is extremely widespread. Skin infections with HPV can bring about noncancerous skin developments called warts (verrucae). Warts are brought on by a quick development of cells on the external layer of the skin. While instances of warts have been depicted since the season of antiquated Greece, their viral etiology was not known until 1907 [16-25].

Skin warts are most regular in adolescence and ordinarily show up and relapse suddenly through the span of weeks to months. Around 10% of adults additionally experience the ill effects of repeating skin warts. All HPVs are accepted to be fit for building up long "dormant" diseases in little quantities of undifferentiated organisms exhibit in the skin. In spite of the fact that these inert diseases may never be completely killed, immunological control is thought to obstruct the presence of side effects, for example, warts. Immunological control is HPV sort particular, which means an individual may get to be distinctly impervious to one HPV sort while staying powerless to different sorts. In one review, disease by HPV types 2, 27, and 57 was found in individuals with warts, while contamination by HPV types 1, 2, 63, and 27 was found in individuals with clinically ordinary skin.

The different types of warts include: Basic warts which are normally found on the hands and feet, yet can likewise happen in different territories, for example, the elbows or knees. Normal warts have a trademark cauliflower-like surface and are commonly somewhat raised over the encompassing skin. Cutaneous HPV sorts can bring about genital warts yet are not related with the improvement of malignancy. Plantar warts are found on the soles of the feet; they become internal, by and large bringing about agony when strolling. Subungual or periungual warts shape under the fingernail (subungual), around the fingernail, or on the fingernail skin (periungual). They are more hard to treat than warts in other locations. Flat warts are most usually found on the arms, face, or forehead. Like normal warts, flat warts happen most as often as possible in kids and teenagers. In individuals with ordinary insusceptible capacity, level warts are not related with the improvement of cancer.

Genital warts are very infectious, while normal, level, and flat warts are substantially less liable to spread from individual to individual.

Virology

The HPV can cause HPV mainly effects the epithelial cells. These cells, which are arranged in layers, cover within and outside surfaces of the body, including the skin, the throat, the genital tract, and the anus.

Once HPV enters an epithelial cell, the infection starts to make the proteins it encodes. Two of the proteins made by high-chance HPVs (E6 and E7) meddle with cell works that ordinarily avert unreasonable development, helping the cell to develop in an uncontrolled way and to stay away from cell passing.

Commonly these contaminated cells are perceived by the insusceptible framework and killed. Here and there, be that as it may, these tainted cells are not pulverized, and an industrious disease comes about. As the tirelessly tainted cells keep on growing, they may create transformations in cell qualities that advance considerably more anomalous cell development, prompting to the arrangement of a territory of precancerous cells and, at last, a destructive tumor [26-50].

Different elements may aggravate the hazard that a contamination with a high-risk HPV type will hold on and potentially form into tumor. These include: Smoking or biting tobacco (for expanded danger of oropharyngeal tumor), Having a debilitated insusceptible framework , Having numerous youngsters (for expanded danger of cervical malignancy), Long term oral preventative use (for expanded danger of cervical disease), Poor oral cleanliness (for expanded danger of oropharyngeal disease), Chronic inflammation.

According to many Scientists, it can take in the vicinity of 10 and 30 years from the season of an underlying HPV contamination until a tumor frames. A condition in which several abnormal cells will be grown on cervix which is called as cervical intraepithelial neoplasia, or CIN. These don't generally prompt or leads to cancer. The estimated percentage of chances leading to tumour from CIN is 50%.

Diagnosis

If the warts are visible, a health care provider can make a diagnosis of HPV during a visual inspection. Extra tests should be finished to completely evaluate type of HPV. The test which will be done regularly for the diagnosis of HPV are Pap Smear test, DNA test, acetic acid test. In Pap smear test, a group of cells are collected from surface of cervix and by this they will detect any abnormality in cervix.

The use of a DNA test will evaluate for the high-risk types of HPV and is recommended for women aged 30 and older in addition with a Pap smear test. Right now, there is likewise a DNA test for HPV, which can be utilized alone without the requirement for simultaneous Pap testing beginning at age of 25.

The utilization of an acetic acid test will distinguish injuries that are not effortlessly observed as any unusual lessions influenced by HPV will turn white. At certain times, a biopsy of any abnormal zones might be necessary.

Currently, there is no test accessible for men to specifically test for HPV and diagnosis is made basically on visual assessment. In certain conditions like if any individual is having any background anal sex then should consult a health care provider and should undergo papsmear.

Prevention

To prevent the HPV infection, Food and Drug Administration (FDA) recommended 3 vaccines namely Gardasil®, Gardasil® 9, and Cervarix®. These HPV vaccines can prevent the HPV infections and can provide strong protection against the HPV infection. It is suggested that before having the sexual intercourse, every individual should definitely take the HPV vaccine such that HPV infection can be prevented. Consistent condom use can also prevent the HPV [51-85].

Treatment

Currently, there is no therapeutic treatment for HPV diseases because they are not related with unusual cell changes. In any case, the genital warts, benign respiratory tract tumors, precancerous changes at the cervix, and diseases coming about because of HPV contaminations can be treated.

Techniques generally used to treat precancerous cervical changes incorporate cryosurgery (solidifying that decimates tissue), LEEP (circle electrosurgical extraction strategy, or the expulsion of cervical tissue utilizing a hot wire circle), surgical conization (surgery with a surgical tool, a laser, or both to evacuate a cone-formed bit of tissue from the cervix and cervical trench), and laser vaporization conization (utilization of a laser to wreck cervical tissue).

Treatments for other types of benign respiratory tract tumors and precancerous changes brought about by HPV (vaginal, vulvar, penile, and butt-centric injuries) and genital warts incorporate topical chemicals or medications, excisional surgery, cryosurgery, electrosurgery, and laser surgery. Treatment methodologies are being tried in clinical trials, including a randomized controlled trial that will figure out if treating butt-centric precancerous injuries will diminish the danger of anal cancer malignancy in individuals who are contaminated with HIV [86-95].

The individuals who are having HPV infection will receive the same treatment as the individuals who are not having HPV infection based on the size, type of the tumours. The individuals with positive oropharyngeal cancer will be treated differently than HPV negative oropharyngeal cancer. Recent studies revealed that HPV positive oropharyngeal cases will have better treatment rate. Other than HPV, there are other viruses like HIV (Human Immunodeficiency viruses) are also present which will be transferred through contact with body fluids [96-101].

Conclusion

Human Papillomavirus is causing HPV infection and it is causing serious health issues. In primary stages only, should diagnose and prevent the further complications. Prevention is better than cure so if any signs like warts were observed then should immediately consult a health care professional and prevent the HPV infection.

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