REVIEW ARTICLE

HPV Vaccine - Duo Visage

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Abstract

Human papilloma virus (HPV) can be transmitted via sexual as well as nonsexual routes. Recently, 'high-risk' HPVs were detected in the oral mucosa of children in whose cases there was no suspicion of sexual abuse. This implies that HPV 16 and 18 have additional nonsexual modes of transmission in childhood, such as vertical transmission and autoinoculation. There are actually over 70 identified strains of HPV. Numbers vary slightly, but it has been estimated that 50 percent of males will have HPV at some point in their life, and 80 percent of females will have some strain of HPV at some point by the time they are 50 years old. Many of the strains are latent, which means you could be a carrier, not have symptoms, and pass it on without knowing it. Some of the strains naturally resolve themselves and go away; however, there are some strains that can be more dangerous. Some of the strains cause warts on the genital area of men and women, and some of the strains lead to cervical cancer in women and other less common cancers such as anus, vagina, and vulva.

Key words: Human Papilloma Virus, Vaccine

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Introduction

The human papilloma viruses (HPVs) are DNA viruses that infect squamous epithelial cells. At least 150 genotypes of HPV have been identified, of which are involved in the development of benign and malignant lesions of the oral cavity specifically tonsillar lesions and carcinoma of the oropharynx. The oral route of HPV transmission is not fully understood. It has been suggested that genital infection can act as a reservoir for oral HPV infection. The possibility of self transmission has also been proposed, which is based on the detection of genetically similar HPV strains in the oral and genital mucosa and due to similarities and due to dissimilarity between their histologic and histochemical studies of oral and genital lesions.[1]

Women with a history of cervical cancer and partners with cervical cancer were reported to have an increased risk of oral cancer. Furthermore, it has been hypothesized that cell-associated HPV can circulate in blood, which could also facilitate self-transmission between genital and oral mucosa in an individual. To analyze the potential role of genital HPV as a route of self-transmission, we used clinical examinations and molecular detection of HPV-DNA to determine whether patients with genital HPV were at risk for HPV in their oral mucosa. Most of these factors are personal habits, including alcohol consumption, smoking, oral hygiene, sexual habits, and diet, the results have been somewhat conflicting, mainly because of differences in study design.[2]

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Low-risk HPV types

Some types of genital HPV can cause cauliflower-shaped warts on or around the genitals and anus of both men and women. In women, warts may also appear on the cervix and vagina. This type of "genital wart" is called a *condyloma acuminatum* and is most often caused by HPV-6 or HPV-11. Because these genital warts very rarely grow into cancer, HPV-6 and HPV-11 are called "low-risk" viruses. These low-risk types can also cause *low-grade changes* in the cells of the cervix that do not develop into cancer.[3]

High-risk HPV types

Other types of genital HPV have been linked with cancers in both men and women. These types are called "high-risk" because they can cause cancer. They also cause lowgrade and high-grade changes in the cells of the cervix and pre-cancers. Doctors worry more about the high-grade changes and pre-cancers, because they are more likely to grow into cancers over time. Common high-risk HPV types include:

HPV-16, HPV-18, HPV-31, HPV-35, HPV-39, HPV-45, HPV-51, HPV-52, HPV-58[4]

HPV and Cervical Cancer

HPV, one of the most common STIs, has been established as the main cause of cervical cancer. While HPV infection is considered a necessary precursor of both cervical cancer and associated precancerous lesions, it is not a sufficient cause, as the majority of women with the infection will not progress to cancer. It is estimated that less than 5% of women infected with HPV who receive no health intervention ultimately develop cervical cancer. Infections with HPV are common in both men and women.[5] Some estimates indicate that more than 50% of sexually active adults in the United States have experienced an infection with one or more HPV viral types. A study, using prevalence data among Finnish women, estimated a woman's lifetime risk of HPV infection at 75%.[6]

Although no effective treatment is available for HPV, the infection is transient in the majority of cases. A study suggests that in up to 70% of those initially diagnosed, the infection is undetectable within two years. A significant proportion of women with HPV infection develop low-grade cervical lesions. Most of these low-grade lesions regress spontaneously; A study suggests that approximately 15% progress to high-grade cervical lesions within two years. High-grade cervical lesions have a strong malignant potential; A study found that about one-third of high-grade lesions progress to cancer within ten years.[7]

Vaccines against human papilloma virus (HPV) have recently been introduced to the national vaccination programmes of several countries. HPV is considered to be the principal cause of cervical cancer in adulthood. In childhood, it causes a wide range of epithelial infections including different types of skin warts, anogenital warts and recurrent respiratory papillomatosis, which is a life-threatening condition in children. To date, over 130 different types of HPV have been identified, each type having less than 90% of its nucleotide sequence in common with the others.[4]

HPVs can be classified into cutaneous and mucosal types.

Cutaneous types infect the squamous epithelium of the skin and produce common warts, plantar warts and flat warts, which commonly occur on the hands, face and feet. Specific cutaneous types are also detected in epidermodysplasia verruciformis (EV), a rare familial disorder related to the development of large cutaneous warts that can progress to skin cancer.[6]

Mucosal HPVs infect the mucous membranes and can cause cervical neoplasia in adults as well as anogenital warts in both children and adults. 'High-risk' mucosal types HPV 16 and 18 are detected in over 70% of women with cervical carcinoma and represent the 'high-risk' types most frequently detected in the female anogenital system.'High-risk' and 'low-risk' mucosal HPVs have also been involved in the development of squamous intraepithelial lesions (SILs).[7]

In the anogenital warts of children, both cutaneous and mucosal HPVs can be present; of the mucosal type, HPVs 11 and 6 are the most frequently detected. Among Non sexually abused children with anogenital warts, cutaneous types are more common in older children above the age

of 4 years, in children with a relative affected by skin warts and in children with skin warts elsewhere. In contrast, mucosal types are more common in girls, in children under 3 years of age, in children with relatives with genital warts and in children without warts elsewhere. Mucosal types 11 and 6 have also been implicated in the pathogenesis of recurrent respiratory papillomatosis (RRP) in children. Patients with RRP infected with HPV 11 are prone to developing more aggressive disease, and more frequently require surgical intervention. To date, data on the presence of HPV in the healthy skin or skin with benign lesions of children are limited.[9]

The Debate

In 2007 there were two vaccines introduced to guard against HPV. With the release of these new drugs, came much controversy. Since it involves one of the most controversial issues in recent times teenage sexual health both those who are for and against the vaccine have stood up to have their voice heard. Some think that it is a great advancement in modern medicine and all teenagers should receive it. Others think the vaccine would only encourage more teens to be promiscuous.[10]

There are two licensed HPV vaccines in this world: Merck makes Gardasil. It contains proteins said to come originally from four different types of HPV. The other is Cervarix by GlaxoSmithkline. It contains proteins said to come from 2 different types of HPV. Both vaccines contain aluminium adjuvants.[11] Both manufacturers recommend that women are still regularly scanned for cervical cancers. The FDA reports that both HPV vaccines, Gardasil (approved in 2006) and Cervarix (approved in 2009), are safe for females ages 9 to 26 years. As of 2009, Gardasil is also licensed, and considered safe for males ages 9 through 26 years. Boys and young men may choose to get this vaccine to prevent anal cancer and genital warts. Both vaccines were tested in thousands of people around the world before they were approved. These studies showed no serious side effects and no deaths have been linked to either vaccine.[12] Common, mild side effects include pain where the shot was given, fever, headache, and nausea. People may faint after getting any vaccine, including HPV vaccines. Fainting after getting a shot is more common in teens than in young children or adults. To keep people from getting hurt from fainting, a 15-minute waiting period for people of all ages is recommended after any vaccination.[13] Both HPV vaccines are still being monitored for side effects, especially rare ones not seen in the study trials. CDC and FDA doctors and scientists still review all reports of serious side effects reported to the Vaccine Adverse Event Reporting System (VAERS) to watch for potential new vaccine safety concerns that may need further study. (The VAERS is a national reporting system that looks at reports of side effects after vaccinations.) To work best, one of the HPV vaccines should be given before any type of sexual contact with another person. Both are given as shots in a series of 3 doses within 6 months.[13]

Girls aged 11 to 12

The vaccine should be given to girls ages 11 to 12 and as early as age 9.

Girls aged 13 to 18

Girls ages 13 to 18 who have not yet started a vaccine series or who have started but have not completed the series should be vaccinated.

Young women aged 19 to 26

Some authorities recommend vaccination of women ages 19 to 26, but the American Cancer Society feels that there is not enough evidence of benefit to recommend vaccinating all women in this age group. women ages 19 to 26 talk to their doctor or nurse about whether to get the vaccine based on their risk of previous HPV exposure and potential benefit from the vaccine. These vaccines will prevent HPV only if they are given before exposure to the virus. According to a national survey: 1 out of every 4 girls in the United States is sexually active by age 15, and 8 out of every 10 girls are sexually active by age 18. 7% of high school students said they started having sex before age 13. The vaccines are recommended for girls ages 11 to 12 because most girls at this age have not become sexually active. If they have been sexually active, they will likely have been exposed to only 1 or 2 types, so the vaccine will be partially protective. This is also an age when girls will be

seeing their doctor and getting other vaccinations.[14]

The benefits of the vaccines?

Both vaccines will prevent the 2 types of HPV that cause most cervical cancers (HPV types 16 and 18). Gardasil has also been shown to prevent anal, vulvar, and vaginal cancers related to these 2 types of HPV. It also protects against the 2 types of HPV that cause most genital warts (HPV types 6 and 11). The vaccines only work in people who have not already been exposed to these types of HPV. The vaccines will not prevent HPV in those who have already had these HPV types. It is possible that the vaccines also could prevent some other HPV-related cancers, including some cancers of the penis and head and neck areas. It will be some time before studies can prove whether they will prevent these cancers.[15]

Can cervical cancer be prevented without a vaccine?

In most cases, yes, cervical cancer can be prevented even without a vaccine. Cervical cancer screening done according to American Cancer Society guidelines and with proper follow up will prevent most but not all cases of cervical cancer. Pap tests (with or without the HPV test) can find cervix cell changes early, before they become cervical cancer. These changed cervix cells can then be treated to keep them from becoming cancer. When cancer screening guidelines are followed most, but not all cervical cancers are found at an early, curable stage. Most cervical cancers in the United States are diagnosed in women who have never had a Pap test, or who haven't had a Pap test in many years.[15]

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