HPV is one of the most common STD's affecting the U.S today. It has become an issue nearly impossible to escape as a sexually active male or female. Oncogenic types like 16 and 18 can lead to genital cancers (mostly in women), cervical cancers, anal cancers and oropharyngeal cancers, according to the CDC. The CDC report on HPV epidemiology also states that, "the incidence of HPV is estimated at 74.1 million new cases of it being sexually transmitted within the U.S each year. In the U.S 79 million women aged 14-59 years are infected with HPV, with the highest prevalence among the ages of 20-24 years" (CDC, HPV statistics).

Women are affected by this disease, more greatly than men, between the ages of 25-29 for men and 20-24 for women. All nearly 100% will be exposed to genital HPV if sexually active or indulging in other forms of sexual activity with infected partners. The report shows that from 2000-2009, incidence rates for HPV associated oropharyngeal cancer increased among white men and women, as did rates for anal cancer among white and black men and women. Incidence rates for cancer of the vulva increased among white and black women. Rates of cervical cancer among white decreased among all women except American Indian and Alaskan Natives. In addition, cervical cancer incidence rates were higher among women living in low versus high socioeconomic areas. Among rates for penile cancer were stable. All linked to high-risk HPV types like 16 and 18 which are oncogenic.
Figure 1:

Human Papilloma Virus

Figure 2:

[Image: CDC image]

The Human Papilloma Virus is a complex of nucleic acid and protein, according to Milestones is Public Health, this is the makeup of all viruses. Upon introduction into the body it integrates with a living cell, which gives it the opportunity to reproduce.

Research, done by BMC Infectious Diseases, has revealed that there is only one integration event that takes place at various locations throughout the human genome. The BMC also stated that, once the virus integrates it begins to replicate. The E2 protein in this virus binds with the bromodomain protein within our genome. The BRD4 is responsible for various types of cellular replication, memory, and regulation of the cell cycle. "BRD4 is highly enriched at super enhancers that maintain expression of oncogenes in tumors. Most HPV infections result in benign lesions, but several are oncogenic and the causative agents of human cancer" (Plos Pathogens, pg.2). Although HPV integration seems to play an important role in the progression of cervical dysplasia, the underlying mechanisms are still unclear" (Oncogene, pg. 1). However, Plos Pathogens reports, "we do know high risk HPV infections are linked to carcinomas and dysplasia in the genitalia of females and males and the most oncogenic are HPV 16&18, which clear more slowly than infections caused by other high-risk types.
HPV 16&18 are the most prevalent in cervical cancer, thus the first vaccines being incorporated to thwart these types. While HPV has been around for a long time, the discovery of its link to various cancers has put the vaccination and genome research on high priority.

**Environmental Attributes**

The social factors related to the prevalence of HPV in women vary along a broad spectrum. Social factors can include age, geographical, and lack of healthcare. Any one of these could be a barrier for women as it pertains to HPV vaccination. Some social factors in the prevalence of HPV among women are also based on sexual activity, coital and non-coital. Social factors play a major role in the transmission of HPV and its link to cervical cancer makes the Public Health and health care communities take notice.

Social factors associated with the prevalence of HPV are related to the individual's surrounding, or in this case, population's environment. Age is also a social factor because different age groups make different choices regarding health care. These choices are also made due to knowledge or lack of knowledge in that particular group. "Individuals in their early teens and early 20's make fewer visits to physicians' offices that at any other times in their lives, and the majority fail to receive all recommended vaccines" (Journal of American College Health pg. 159).
Descriptive Epidemiology

Figure 3: CDC HPV map image 2006-2010.

Geographical locations also affect the prevalence of HPV. According to a research article done on the Mississippi delta, "historically this area has had several fold higher annual rates of cervical cancer incidence and mortality that those of the general U.S. The aim of this analysis was to report the age and ethnic specific prevalence of HPV in this population"(BMC Infectious Diseases pg. 1). Populations in low income or low socioeconomic status may not have access to the healthcare that provides the information, check-ups and vaccinations regarding HPV.
Gaps in Knowledge

Risk factors include multiple partners, careless sexual activity, and mother to baby transmission. However, HPV is predominately associated with unprotected intercourse or genital to genital contact where warts are present. With those staggering numbers it is somewhat safe to conclude that most every sexually active man and woman will acquire genital HPV infection at some point in their lives. It is important for this population to know the dangers of HPV and what it can lead to. In order for the public health sector to reach the masses is learning the best way to inform them.

The general consensus among the healthcare professionals and public health sector is education. The content of information according to various articles ranged from pap-smear knowledge, to HPV risk factors, to HPV transmission, to HPV vaccination. "Findings from one study indicated the critical need for clear and consistent health education about the purpose, meaning, timing and consequences of pap smear testing" (Journal of Women's Health pg.73). A more effective way to get the word out about HPV and its link to cancer is very important. The effect HPV has on a woman getting cervical cancer is very high and young girls are at risk of contracting the disease without ever even knowing.

Then, as a woman, finding out that it has led to cancer is a devastating blow. Parents of young girls and young women need to know what is out there for prevention, intervention, and information.
Conclusion

In conclusion, HPV has a high incidence rate among the population of college women. However, its prevalence ranges across older age groups of women, possibly due to societal gaps in knowledge. Everyone that becomes sexually active will most likely be infected with the virus, and it is linked to various cancers including, the most prevalent, cervical cancer. The goal of public health is to analyze the data, formulate solutions, and implement policies and programs that will help to prevent HPV. It has been around for decades however its link to a number of cancers has given it a new priority. New research and technology has helped increase the knowledge within the medical and public health communities. The focus now is getting that information to those girls and women who are misinformed about HPV, and it is up to public health agencies and organizations to inform all the populations that are affected by this virus.
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