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Human Papillomavirus

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Introduction

Human Papillomavirus (HPV) is the most common sexually transmitted infection (STI) across the United States with approximately 42.5% of Americans aged 18-59 infected with the virus and approximately 14 million new cases of HPV each year (CDC, 2017). Numerous variations of this disease exist, leading to diverse symptoms and reactions. Depending on the strain, HPV can remain labile or transient for those infected; however, other strains of HPV can lead to lifelong consequences as great as death in some patients (Mirabello et al, 2018).

Approximately 485,000 cases of cervical cancer related to high-risk HPV strains were diagnosed globally in 2008; 236,000 of these cervical cancer patients died that same year (Mirabello et al, 2018). There is a vaccination to protect patients from four of the major high-risk cancer or genital wart causing strains of HPV, but completion of this vaccination series across individuals in the United States is lower than anticipated. Healthy People 2020 includes a goal of 80% of all males and females between the ages of 13-15 complete the HPV vaccination series (ODPHP, 2018). However, as of 2015, only 42 percent of girls and 28 percent of boys in this age group have been administered all three doses of this series (CDC, 2017). Due to its virality and prevention capability, HPV is a hot topic of interest amongst health providers that continues to be explored.

Transmission

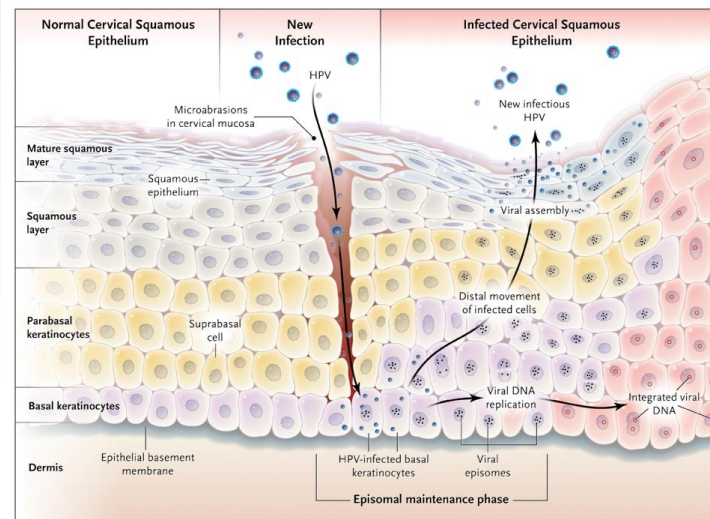
- ▶ HPV is contracted through direct skin to skin contact in both males and females (CDC, 2016).
- ▶ Transmission is typically from oral, vaginal or anal sexual activity (CDC, 2016).
- ▶ Increased likelihood of infection can occur due to: promiscuity, having sexual contact with an individual who has had multiple sex partners, initiation of sexual activity at an early age, and lack of circumcision (Rigaud, 2015).

Signs and Symptoms

- ▶ Over 200 forms of HPV have been identified (Mirabello et al, 2018).
- ▶ Amongst these types, HPV is classified into "high" or "low" risk categories based on the ability to become cancerous (Soto, Song, & McLaughlin-Drubin, 2017).
- ▶ High-risk strains are often persistent and can lead to genital, anal or oral cancers (Soto et al, 2017).
- ▶ The more typical carcinogenic variations of HPV include high risk strains, such as HPV 16 and 18 (Crosignani et al, 2013).
- ▶ Low risk HPVs are typically transient or cause little to no symptoms (Crosignani et al, 2013).
- ▶ Low risk strains such as HPV 6 and 11 may also cause minor symptoms such as genital warts (Crosignani et al, 2013).
- ▶ Many individuals do not know they have HPV (Rigaud, 2015).
- ▶ Approximately 70% of HPV infections are cleared within one year, and 90% of infections are cleared at 2 years (Rigaud, 2015).
- ▶ Often cervical diagnosis of HPV occurs through routine cervical cytology testing, or a Pap smear, in women. Otherwise, HPV may not be identified until cancerous lesions or warts are found (Rigaud, 2015).

Underlying Pathophysiology

- ▶ Human Papillomaviruses are microscopic, DNA pathogens that invade the body through small tears or abrasions in epithelial tissue such as the cervix, oropharynx, and skin (Crosignani et al, 2013).
- ▶ HPV cells infect basal keratinocytes located in the basement layer of the tissue's stratified squamous epithelium (Crosignani et al, 2013).
- ▶ E6 and E7 oncogenes found within these HPV cells disrupt the normal function of cellular p53 and retinoblastoma proteins, leading to increased production of abnormal basal cells (Soto et al, 2017).
- ▶ Continued replication of HPV infected basal cells leads to disorganization in the epithelial structure as these cells continue to proliferate and mature (Mirabello et al, 2018).
- ▶ For most individuals, the body interrupts such an HPV infection through immune system recognition and intervention. HPV infections can be eliminated within 2 years of exposure (Rigaud, 2015).
- ▶ However, persistent HPV infection can lead to more critical, carcinogenic results (Crosignani et al, 2013).



The photo above illustrates the HPV infection process at the cellular level (Kahn, 2009).

Significance

- ▶ High risk HPVs are known to cause approximately 5% of all human cancers (Soto et al, 2017).
- ▶ American men and women are diagnosed with approximately 33,369 HPV related cancers each year (Crosignani et al, 2013).
- ▶ HPV is also now known as the direct cause for greater than 95% of all cervical cancer cases, the 3rd leading cancer amongst women (Mirabello et al, 2018).
- ▶ HPV carcinogenic lesion progression is slow. Cancerous lesions may not be symptomatic or identified until 10-15 years following initial infection (Crosignani et al, 2013).
- ▶ Without early detection and intervention, cancerous lesions resulting from HPV infection may be lethal in some patients (Mirabello et al, 2018).

Conclusions

Human Papillomavirus is a common pathogen affecting American people. Per the CDC, approximately 80 percent of all people will have some form of HPV during their lifetime (2016). Though most strains of HPV are temporary and seemingly harmless, other more virulent strains may cause complications such as cancer of the cervix, penis, anus, or oropharynx. Prevention and detection are key. Education on the disease and vaccination using Gardasil 9 are essential for providers to implement amongst patients, particularly parents and adolescents. Continued screening through annual Pap smears are also important for early identification of HPV causing cervical cancers in women.

Nursing Implications

- ▶ As healthcare providers, HPV prevention can be facilitated through regular screening, patient education and vaccination.
- ▶ Screening done through cervical Pap smears are recommended every 3 years for women aged 21-65 (Rigaud, 2015).
- ▶ Musa et al found that women exposed to HPV education were 2.5 times more likely to attend routine Pap smears for cervical disease screening (2017).
- ▶ A vaccination series called "Gardasil 9" exists to prevent 9 of the most common high risk and genital wart causing HPV strains. This series is either 2 or 3 steps depending on age initiation (Merck Sharp & Dohme Corp., 2017).
- ▶ Initiating the HPV vaccination at an early age prior to sexual contact is key to prevent HPV infection. Gardasil 9 may be administered from ages 9-26 (Merck Sharpe & Dohme Corp., 2017).
- ▶ Population completion of the Gardasil 9 series has been less than hoped. Due to issues such as the complexity of the multi-step dosing, low perceived risk and stigma of sexual intimacy discussion for younger adolescents, Garbutt et al finds challenges to Gardasil administration (2018).
- ▶ No cure exists for HPV infections (Rigaud, 2015).

References:



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