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Pathophysiology of Human Papillomavirus (HPV)

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What is HPV?

- HPV is the most common sexually transmitted virus and can result in various types of cancer in both men and women
- HPV can be transmitted through intimate skin contact and primarily through sexual intercourse

Risk Factors

- Half of all sexually active people will contract HPV at some point in their lifetime (McCance & Huether, 2014, p. 423)
- Risk factors include unprotected intercourse, numerous sexual partners, and age at first intercourse.
- Teens that are sexually active and “young adult females are at a higher risk” (Valentino & Poronsky, 2015, p. 155) of contracting the virus, compared to women and men over 25.
- Those that are immunocompromised, such as young adults with HIV.
- Smokers have higher rates of HPV infection.
- Contracting herpes or chlamydia increases the risk of HPV infection “due to inflammation of the epithelial cells and breaks in the epithelial layer that allows a pathway for HPV introduction” (Choma & McKeever, 2015, p. 52).

Signs & Symptoms

- Once infected, many patients remain asymptomatic and most cases resolve on their own.
- The virus can remain dormant for years and then appear reactivated
- Appearance of anogenital warts or an abnormal pap smear are signs of likely HPV infection

Prevention

Screening and Lifestyle Modification

- “Healthy People 2020 has a target of 93% for cervical cancer screening (Viens et al, 2016, p. 665).”
- Regular pap smears for women aged 21 to 65 are a key part of cervical cancer screening, which looks for precancers. An HPV test can also be performed (cdc.gov).
- Currently, there are “no recommended screening tests for HPV infections in young men” (Rigaud, 2015, p. 139).

Vaccination

- In 2006, the FDA approved the first vaccine against HPV (Valentino & Poronsky, 2015, p. 157).
- According to the CDC, “30,000 cases of cancer could be prevented with HPV vaccination each year” (cdc.gov).
- Ideally, this vaccine is given prior to any sexual activity.
- The vaccine is given as a three series intramuscular injection for girls 14-26 and for boys 14-21. A two series injection is given for boys and girls aged 9 to 12 (cdc.gov).
- In clinical trials, two of the vaccines, Gardasil and Cervarix were both found to be highly immunogenic…” (Valentino & Poronsky, 2016, p. 157).

Underlying Pathophysiology

- The HPV virus is a “small, double stranded DNA virus that infects the mucosal or cutaneous epithelium” (Valentino & Poronsky, 2015, p. 156).
- Since HPV affects epithelial cells and does not enter the bloodstream, “having an HPV infection in one part of the body should not cause infection in another part” (McCance & Huether, 2014, p. 424).
- Once HPV gets into the epithelial cell, “the virus begins to make proteins that can interfere with normal functions in the cell, enabling the cell to grow in an uncontrolled manner and to avoid apoptosis” (McCance & Huether, 2014, p. 424).

Human Papilloma Virus

- The HPV virus, which infects the mucosal or cutaneous epithelium, can result in various outcomes of the virus, mostly likely strain to cancer (Valentino & Poronsky, 2015, p. 156).
- Since HPV affects epithelial cells and does not enter the bloodstream, “having an HPV infection in one part of the body should not cause infection in another part” (McCance & Huether, 2014, p. 424).
- Once HPV gets into the epithelial cell, “the virus begins to make proteins that can interfere with normal functions in the cell, enabling the cell to grow in an uncontrolled manner and to avoid apoptosis” (McCance & Huether, 2014, p. 424).

Significance of Pathophysiology

- Understanding the pathophysiology allows for the development of evidence-based screening and prevention tools, thus saving millions of dollars as well as thousands of human lives.

Future Research

- New studies in cervical cancer research illustrate that “therapy directed toward disrupting function of the 6E and 17 oncogenes may help reverse aberrant DDR signaling that occurs as a consequence of HPV infection” (Loy et al, 2016, p. 31).

Nursing Implications

- The main catalyst for a patient receiving the HPV vaccine is “a strong provider recommendation” (Valentino & Poronsky, 2015, p. 155).
- Unfortunately, many health care providers do not acknowledge the HPV saving benefits of the HPV vaccine.
- Advanced Practice Nurses play a key role in “education and advocacy for receiving the vaccine” (Valentino & Poronsky, 2015, p. 155).
- APNs must focus their care on what affects young women: “STI screenings, reproductive health needs, lifestyle modifications, and primary prevention, and risk reduction education” (Choma & McKeever, 2015, p. 51).

Conclusions

- While HPV does not directly cause problems with heart, kidney, or cancer in men, the effects on men are just as important as for women due to the “disproportionate effect on men’s health” (Valentino & Poronsky, 2015, p. 162).
- Many strains as young adults may be preventable through vaccine and others through lifestyle modifications and safe sex practices.
- APNs have a responsibility to educate both men AND women and to dispel any myths around the vaccine that evidence has shown, helps to widely decrease incidence of the virus.

References