

HPV the Importance of Vaccination

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Human Papillomavirus (HPV) represents a collective of approximately 150 viruses with more than 40 types infecting the genital areas of males and females. The Center for Disease Control (CDC) in the USA has linked persistent HPV infection to nearly every case of cervical cancer, 69% of vulvar cancers, 75% of vaginal cancers, 63% of penile cancers, 91% of anal cancers and 72% of cancers of the throat. In fact, each year 17,500 women and 9,300 men are affected by HPV related cancers in the USA. Almost 180 million individuals in the USA are infected (1 out of every 4) and about 14 million more are infected with the virus each year^[1]. While it is not possible to predict which HPV infection will progress to cancer, HPV vaccination may prevent many of these cancers. Obviously, prevention is better than the treatment associated with these cancers such as radical surgeries, chemotherapy and radiation.

Some of the virus types infect the epithelial tissues and produce warts and papillomas (non-oncogenic) while others infect the mucosa of the genital tract and oropharynx (oncogenic). The most common oncogenic types are HPV 16 and 18 and the most common non-oncogenic types are 6 and 11. The International Agency for Research on Cancer has identified 12 high-risk HPV types including 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59^[2]. There are 3 HPV vaccines that have been approved by the US FDA Gardasil (quadrivalent) vaccine was approved in 2006 for females against HPV 6,11,16,18. In 2009 Cervarix (bivalent) vaccine was released for prevention of HPV 16 and 18 also for females. In 2014 Gardasil 9 (9- valent) vaccine was approved for males and females for prevention of HPV 6, 11, 16, 18, 31, 33, 45, 52, and 58^[1]. As yet, the available vaccines are not recommended for treatment of a particular HPV infection but may be used for prevention of not yet acquired types. These vaccines stimulate the body's antibody response so that in future encoun-

ters with the virus these antibodies will then prevent the virus from infecting cells. These current vaccines are based on viral-like particles formed by the HPV surface components^[3]. The particles are not infectious because they lack the virus's DNA. Because these particles are immunogenic they induce high levels of antibody response to viral exposure^[3]. In fact, the viral-like particle technology used in the vaccine was developed in collaboration with the National Cancer Institute who then licensed the technology to Merck and GlaxoSmithKline for vaccine development^[3]. Before licensure the FDA assures that the vaccine is safe and effective. These 3 vaccines have undergone clinical trial testing in and outside the United States^[1,2,3].

In July of 2013 Japan's Ministry of Health, Labour, and Welfare (MHLW) withdrew its promotion of vaccination following a suit filed on behalf of several females alleging adverse events associated with receiving the vaccine^[4]. The Vaccine Adverse Reactions Review Committee did not find any evidence to support a causal association with vaccination and the reported events. While an individual could still obtain the vaccination, the rate of active vaccination fell from > 70% to < 1%. The experience of the vaccine rollout was a topic of discussion at the EUROGIN conference in Salzburg, Austria, in June of 2016. One of the abstracts was from the Department of Women's Health Medicine at the Hokkaido University Graduate School of Medicine of Japan. The abstract (WACO I-04) addressed the influences of media, and the political - socio-cultural environment on the pro-active recommendations for vaccine immunization. Another abstract by Miyagi, et al, (WACC I-06) representing input from multiple medical universities within Japan, also analyzed influences upon Japan's suspension of its recommendation for vaccination and likewise listed media influence as a significant factor. Their findings were confirmed by a web-based survey presented



at the same conference by Motoki, et al (WACC-II-18) [5].

The World Health Organization (WHO) published a position paper on HPV vaccines in 2009 and updated the paper in 2014. The position papers are reviewed and endorsed by the WHO strategic Advisory Group of Experts (WHO SAGE). The principle change in the WHO position since 2009 concerns the dose schedule of the administration of the vaccinations for differing age groups. The safety committee has reviewed the data and concluded the vaccines to have an excellent safety profile^[6].

In the United States alone 4,400 women die from cervical cancer each year^[1]. The World Health Organization (WHO) has published that in 2012, 266,000 cervical cancer deaths occurred world-wide with 528,000 newly diagnosed. More than 80% of cervical cancer cases occur in less developed regions of the world. It is estimated to be the 4th most common cancer in women^[6]. The Global Initiative Against HPV and Cervical Cancer estimates that every two minutes a woman will die of cervical cancer, a disease directly related to an HPV infection^[7].

Screening and treatment options are very limited globally as access to care is influenced by many factors such as poverty and resources in the region.

Given the safety and efficacy of these vaccines, our population needs to adopt the vaccines as a preventive measure covering the majority of oncogenic HPV related cancers in a sustainable and durable program. We need to recognize and overcome barriers to vaccination.

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