Three Doses to Finish: A Review on Completion of Human Papillomavirus (HPV) Vaccination among Adolescent Females Aged 12-17 years

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Abstract

Human papillomavirus (HPV) related cancers have become a major public health concern. About 90% of HPV-related cancers are caused by HPV 16 and 18 strains. The virus can cause various cancers, such as oropharyngeal, anal, penile, but most of the HPV related cancers are dominated by cervical cancer. About 70% of all cervical cancers are caused by HPV infection. HPV vaccination in the U.S still remains an important public health challenge with the rate of vaccine initiation of just 50%. Therefore increasing the pattern of HPV vaccine uptake is an important public health issue to increase the overall vaccination coverage. Improving parental awareness among adolescents and their mothers about HPV vaccine and its triple course regimen can significantly reduce later risk of HPV infection and cervical cancer among adolescent females. This article expands the understanding of HPV vaccine's initiation and completion among adolescent females. An intervention called three doses to finish is also proposed in the article, to increase the awareness of HPV vaccine, and completion rates of the vaccination by an educational seminar and text message reminders.

Keywords: Cervical cancer; HPV; Vaccine; Adolescent females; Intervention

The Burden of Cervical Cancer

Cancer is the leading cause of death in developed countries and second leading cause of death in developing world [1]. The burden of cancer is still increasing due to number of reasons including cigarette smoking, physical inactivity, unhealthy diets etc. Certain viruses like (EBV) Epstein Barr virus, (HPV) Human Papillomavirus and (HIV) Human Immunodeficiency virus also have the ability to cause cancer [2]. Although lung, breast and colorectal cancers are the leading cause of mortality among women, and cervical cancer still holds an important place in cancer causing mortality among females [3].

Cervical cancer is the third most commonly diagnosed cancer and the fourth leading cause of mortality in females in the world, contributes to about 9% of the total new cancer cases and 8% of total number of deaths due to cancer among women [4]. Estimates of worldwide burden of cervical cancer indicates that 529,8000 cases and 275,100 deaths occur due to cervical cancer every year [2].

The highest incidence rates of cervical cancer are seen in Eastern and Southern Africa [3]. India, accounts for about 27% of all the disease cases of cervical cancer .3 In United States, the incidence of cervical cancer is getting decreased [3]. However it is still found to show high incidence rates in Hispanics, 4 and African American ethnicities of the country [5]. The incidence rate of cervical cancer is 34% higher and the mortality rate is double in African American women when compared to White American females [4]. Hispanic women in United States show incidence and mortality from cervical cancer about 50-70 times higher than non-Hispanic white females [5].

Risk Factors of the Disease

Some of the most important risk factors of cervical cancer includes early age at first sexual intercourse, infection with Human Papillomavirus, multiple sexual partners, active and passive cigarette smoking, high parity, prolonged use of oral contraceptives (>5 years) [6]. Human Papilloma virus causes almost all cases of cervical cancer. It also causes some non-cervical cancers like vulvar, vaginal, anal, and penile and oropharyngeal cancer [7]. For cervical cancer, the rate of HPV transmission increases with the increase in number of sexual partners, multiparty and early age at first sexual experience [8].

Screening for Cervical Cancer

High quality screening methods for cervical cancer, such as Papanicolaou smear cytology testing (Pap smear) has significantly reduced the morbidity and mortality from squamous cell carcinoma of the cervix that constitutes 90% of all cervical cancers [9]. This reduction in mortality is due to increased detection of the advance disease in early stages, and the detection of pre-invasive lesions that reduces the overall incidence of invasive cancer [5]. It is very much understood now that persistent infection with Human Papillomavirus (HPV) is necessary for the development of cervical cancer.10 Different subtypes of HPV, like HPV 16 and HPV 18 are highly carcinogenic genotypes, and can cause cervical cancer. Thus cervical carcinogenesis proceeds as: acquiring Human Papillomavirus, persistent infection of HPV, progression of the disease to precancerous stage, and the stage of invasive disease [5,10,11].

The importance of cervical cancer screening lies in the fact that one half of cervical cancers in the US are in women who have never been screened. About 10% of cervical cancer 12 Mwhoa

years [14]. For women in the age range of 21-29 years, screening for

sexual life [37], another set of parents in the survey, regarded the vaccine as un-necessary, which is something frightening for public health professionals [37]. In North Carolina, lack of HPV vaccine completion was found to be higher among teenagers who are not very compliant about their routine visit to their doctor [38]. According to Schluterman et al. [39] HPV vaccine completion was low among African-American female teens compared to Caucasians in their study [39], and population that had public health insurance showed better

Papillomavirus infection and its dangerous outcomes, to educate mothers and daughters about the HPV vaccine, its access, and increase the awareness among the targeted population about vaccine's doses and the importance of completing all the doses before the onset of sexual activity; 2) to promote and increase the adherence to vaccines multi-dose regimen.

Health Promotion Setting for Intervention and the Target Audience

Three doses to finish, is proposed as a school based intervention that can target any public school of the country. The education about HPV infection, its vaccination and the importance of adherence to the regimen can best be delivered at the school. The school is selected as

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