The advancement of the HPV vaccine program: focus on adolescents

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Abstract. HPV is currently a major hazard to human health. Whether the HPV vaccination program will be effectively promoted in the future depends on the awareness and attention of adolescents and children to the vaccine, and whether their parents are willing to let adolescents and children to be vaccinated.However,a number of issues have arisen in the process. The main thrust of this writing is to examine and review the relevant literature,including the background knowledge of prophylactic HPV vaccine,personal acceptance by adolescents and parental acceptance, and some of the potential social issues.It summarizes the existing types of prophylactic HPV vaccines and the corresponding disease prevention, the principle and background of prophylactic HPV vaccines.Some of the potential social issues, such as conspiracy theorists' rumors about the prophylactic HPV vaccine, people's prejudices about the vaccine, and the price of the vaccine are described.In the end, the future application of prophylactic HPV vaccinesis prospected.

Keywords: HPV, prophylactic HPV vaccine, parents, adolescent, potential social issues.

1. Introduction

HPV harms people in many ways. Different types of HPV can cause different clinical manifestations and different diseases. The field of dermatology is no longer only concerned about condyloma acuminatum, and there are more and more reports and studies on other diseases related to HPV infection, such as Bowen-like papulosis and Buschke-Lowen- Stein (BL) tumor,cervical cancer and other diseases. HPV involves many diseases, a wide range, most of the harm is rare, it can not only cause benign proliferative diseases, but also related to tumors; Transmission is not only through sexual contact, but also through certain routes of contamination. At present, people's low awareness of HPV and the incorrect popularization of Internet knowledge may lead to the decline of HPV vaccination rate, especially among adolescents. Financial pressure felt by parents, acceptance, and the individual acceptance of teens are all linked to this. In order to reduce the HPV infection rate and thus increase the anti-infection rate, we should take some measures to increase people's willingness to vaccinate. We can start with the cognitive improvement of parents and teenagers. At the same time, the knowledge education in schools is very important, and the publicity and education from all walks of life is also very important [1].

2. Concerns about HPV vaccine

It is well known that the prophylactic HPV vaccinesis there,but People from Mainland China don't really know about it [2].Human papillomavirus vaccine to prevent human papilloma virus in several specific subtype of infection [3].It works by using the L1 shell protein of the HPV virus to induce the production of virus-like particles [4],Assembled in different vectors such as yeast,it can stimulate human humoral immunity and produce specific antibodies.The antibody titer can be increased by more than 10 times, so that vaccine recipients can obtain immunity to the corresponding subtype of HPV [5].Currently,there are three prophylactic HPV vaccines available worldwide: GlaxoSmithKline's bivalent vaccine Cervarix (Cervarix; Cervarix; For high-risk subtype, can use a tetravalent vaccine Merck Gardasil4. (HPV16 and HPV18, HPV6 and HPV11). Vaccine Gardasil9 can target price and nine (HPV16 and HPV18, HPV31, HPV33, HPV45, HPV52, HPV5) and low-risk subtypes (HPV6 and HPV11) [6].At the same time, Prophylactic HPV vaccination is not only

suitable for women, but can also be used to prevent genital warts and cancers of the anus and throat caused by the human papillomavirus in men [7].The vaccination schedules and users of the three vaccines mentioned above are summarized in Picture 1.But the data shows it, these people should not be vaccinated against HPV [8].People who have an allergic reaction to vaccine-based drugs. Patients with moderate to severe acute illness. This group should be vaccinated only after the acute illness has recovered, as well as pregnant women [9].

Table1. Comparison of three prophylactic prophylactic HPV vaccines [6]

Commodity Information	Cercarix	Gardasil4	Gardasil9
The manufacturer	GSK	Merck&Co	Merck&Co
Recombination expression system	Insect cells	Saccharomyces cerevisiae	Saccharomyces cerevisiae
Prevention of HPV subtypes	HPV16, HPV18	HPV6, HPV11, HPV16, HPV18	HPV6, HPV11, HPV16, HPV18, HPV31, HPV33, HPV45, HPV52, HPV58
Efficacy of prevention	75% cervical cancer	75% cervical cancer	90% cervical, 80%CIN2-3
Time and frequency of inoculation	0, 1, 6month (3 times)	0, 2, 6month (3 times)	0, 2, 6month (3 times)
Recommended age of vaccination	Women aged 9 to 25	Women aged 20 to 45	Women aged 16 to 26

Persistent infection of HPV is one of the important reasons lead to cervical cancer. This vaccine can block HPV infection in humans, thereby reducingthe incidence of related diseases. WHO proposed that the vaccines should be added in national immunization schedules and that HPV vaccination strategies should first consider increasing coverage among girls aged 9 to 14 years, with high vaccination coverage among underage females (above 80%) having the most significant impact on the reduction of related diseases [10].HPV vaccines are being developed for different populations,vaccination rates among people of appropriate age are gradually increasing in all countries, which brings Can bring good news to cervical cancer and other diseases [11].The use of human papillomavirus vaccines has been approved in many countries and regions around the world. Both current vaccines are safe, as evidenced by national clinical trials and use surveillance data in Australia [12].A cohort study involving about a million people found no evidence that HPV vaccine use was associated with neurological diseases, immune disorders, or venous thrombosis.The HPV vaccine protects against many diseases, but there are also drawbacks.From 2006 to 2013, 57 million quadrivalent vaccinations were recorded with VAERS, and 21,194 adverse reactions were recorded, according to post-marketing data.Of these side effects, head pain, nausea, fatigue, fever and weakness are the most common. By 2011, 72 post-injection deaths had occurred.

HPV vaccination not only depends on the attitude of individual adolescents, but also on the attitude of parents.According to a study in Taiwan, while 78 percent of parents had heard about the cervical cancer vaccine, only 47.3 percent had heard about human papillomavirus and had insufficient knowledge about it. Parents' willingness to have their daughters vaccinated was high, with 90.6 percent willing to receive the vaccine free of charge, but affected by financial barriers, only 49.4 percent were willing to pay for it. In addition, the Rogis regression results showed that economic factors, vaccine safety and efficacy, and concerns related to sexual behavior were associated with parental acceptance of vaccines [13].Furthermore, according to a study in the Journal of Adolescent Health, 18% of daughters were not vaccinated, despite being offered the vaccine; 34% have not been vaccinated and do not plan to be vaccinated in the next 12 months; 22% have not been vaccinated but intend to be so in the next 12 months; 26% of people have started or completed inoculated. Mothers who do not plan to get vaccinated also do not seem to feel a sense of urgency, given the novelty of the vaccine.So, for adolescents, their vaccination program is really in the hands of their parents. The

combined awareness rates of HPV and HPV vaccine among Chinese parents were 28.21% and 18.91%, respectively, and the combined acceptance rate of HPV vaccine was 41.35%. Parents of adolescents in mainland China have low awareness and vaccination rates of HPV and HPV vaccines [14].People in metropolitan areas have higher knowledge of HPV than those in western areas, but the overall proportion is still low, and most of the women in remote areas in China are lack of basic knowledge about HPV [15].Low parental awareness may prevent young people of appropriate age from being vaccinated.Not only that,Chinese journal of school doctor, according to data from the survey on college students of HPV vaccine and its cognitive situation, of the college students surveyed, 57.7% did not heard of HPV vaccine. 42.7% of college students had heard about HPV-related diseases. Only 30.2% of college students are worried about HPV-related diseases, and 54.6% think routine examinations are still needed after vaccination[16].Therefore, parental and adolescent awareness of the vaccine is an important part of the implementation of the adolescent HPV vaccination program.

For the first issues, According to the aforementioned parents, there are financial concerns about the cost of vaccines.Especially the human papilloma virus vaccine pricing will be high utilization rate in China is a major factor. At present, the price of the HPV vaccine in Hong Kong for 299-597 dollars, but with the producers to take low price strategy, in China, three doses of the vaccine could cost less than $150.3. However, even at that price, it would still be China's most expensive vaccine.Second,Conspiracy theorists believe the HPV vaccine is being used by Western countries to destroy the Chinese people. This has led to a nationalistic public backlash in a country with such a strong historical legacy [17].The journal of pediatric and adolescent of department of gynaecology, according to a study of most of the video to the vaccineThe basic key of the video does not predict the spread of the video. Video reports of people supporting vaccination were four times more accurate than anti-vaccination messages.The most common comment topics were severe side effects, conspiracy theories, and the general unhealthiness of vaccines. Widely watched a YouTube video containing errors and inaccurate message. The vaccine thought is widespread in the video content and comments [18].

3. How to improve HPV vaccine acceptance

According to the situation described in this paper, teenagers are easy to be misled in today's developed Internet environment, and their parents' low awareness of HPV vaccine and their personal low awareness of HPV vaccine is still a big problem. We hope that the knowledge popularization and publicity of HPV and HPV vaccine can be done more widely and in place. Schools should also strengthen the education of relevant knowledge to teenagers. The low cost of vaccines and the high price of children are difficult problems. We hope that relevant departments can make adjustments and introduce some favorable policies, These additional expenditures, such as one study showing that subsidies are needed to achieve optimal vaccination rates; Or, tetravalent vaccine must each agent to be reduced [19].This will help to promote adolescent vaccination programmes and increase vaccination rates, which will lead to higher prevention rates of related diseases.

What’more,one way to do this would be to insure adolescent HPV vaccination programmesIn an effort to reach a larger audience, many states require private insurers to add vaccines to their business scope and enact legislation,but only a few.For children 18 and under, the federally funded VFC will cover the costs of Medicaid if they are eligible for Medicaid but not otherwise insured [20].

Third, increased public awareness and knowledge gained from popular science will also benefit the implementation of vaccination programs.According to a study, the frequent vaccine safety incidents in China in recent years, the public's trust in the vaccine has declined, and the media reports are also unreasonable, resulting in the low vaccination rate of HPV vaccine. The use of mass media for public health education and publicity can promote the change of public health behavior. In order to better popularize the HPV vaccine and increase the vaccination rate, Chinese media reports should focus on public opinion and be vigilant against anti-vaccine comments. Identify the target population,

pay attention to the publicity of parents, improve the accuracy and completeness of health communication; Break through the information stage, strengthen the communication with the audience, and innovate the reporting mode [21].

4. Conclusion

Health care providers should anticipate the financial problems that parents may have with their children's HPV vaccination, as well as the personal acceptance issues of parents and adolescents. Medical awareness among parents and adolescents needs to be improved, and HPV vaccination requires a multifaceted community effort. This will help reduce HPV infection rates, help protect these children from adolescence, and more importantly ensure that they have a long and healthy life growing up. It is believed that with the joint efforts of many parties, the HPV vaccination program can be effectively implemented and reach the health initiative of WHO.

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