

A SYSTEMIC REVIEW ON NEWLY DEVELOPED HPVS VACCINE ‘CERVAVAC’

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Abstract

In day today life as India is under developing country, cervical cancer cases in women are the most common diagnosis as per the report published by the global cancer observatory. According to the report around 60412 were diagnosed with it and 34183 succumbed to death. According to WHO India is underperforming to manage cervical cancer programme. As it lacks a national immunization programme for carcinoma Cervix eradication. The bivalent and quadrivalent vaccine were being introduced in Indian market in 2008. Recently India achieved a big success to the technical competence and mass production capability for its Indigenous quadrivalent vaccine “Cervavac” developed by serum institute of India and coordinated with the department of Biotechnology, Government of India. Throughout this general review we have targeted on the role, drug activity, Identification and safety information of the newly developed vaccine -Cervavac.

Key words-Human papillomavirus,Cervical cancer, Carcinoma, cervix eradication, bivalent, Quadrivalent

HPV (Human papillomavirus)
HPV VIRUS

is the leading cause of at least 6 types of cancer

4 out of 5 will get HPV infection in their lifetime

HPV spreads through intimate physical contact

Cancer caused by HPV may not have warning symptoms or signs until they are advanced.

Preventing cancer is better than treating cancer

HPV VACCINE

HPV vaccine is 90% effective in preventing cancers caused by HPV virus.

HPV vaccine is most effective between ages 9 - 12.

Teens girls and boys should get vaccinated regardless of their sexual activity.

Talk to your child's healthcare provider about HPV cancer prevention between ages 9 - 12. Unvaccinated teens and young adults between 13 and 26 years of age should get vaccinated regardless of their sexual activity.

ACT NOW

VACCINATE YOUR CHILDREN TODAY TO PROTECT THEIR HEALTH TOMORROW

Age For Taking HPV Vaccine In India

Age 9-14
2 dose HPV vaccine, 0 and 6-12 months

Age 15-26
3 dose HPV vaccine, 0, 1-2 and 6 months

Age 21-26(Male)
Vaccine offered, 3 dose regimen

Age 27-45
FDA approved, but not routinely recommended

Note: Consulting a doctor before vaccination is advisable.

How does the HPV vaccine work?

Without vaccine ✗

Person with human papilloma virus (HPV)

High-risk types of HPV can damage DNA

This can cause cells to divide and grow out of control

This can lead to cancer

With vaccine ✓

Vaccination provides protection against the main types of high-risk HPV - HPV16 and HPV18.

Person is not infected with HPV 16/18

Less chance of cells being damaged

We will see fewer cancer cases

By protecting against HPV infection, we can help prevent cell changes and reduce the risk of cancer.

Together we will beat cancer

CANCER RESEARCH UK

INTRODUCTION

Almost all cervical cancer cases are linked to certain strains of HPV, a common virus that is transmitted through sexual contact. The body’s immune system usually gets rid of the hpv infection naturally within two years. However, in some percentage of people the virus can linger over time and turn some normal cells into abnormal cells and then cancer.

Cervavac was developed by the pune based Serum Institute of India in coordination with development of Biotechnology. The project to develop the vaccine was implemented by the then secretary of DBT, Dr M K Bhan in 2011.It received the market authorization approval from the drug controller General of India and Lunched on Tuesday, January 24 ,2023 which is India’s National girl child day. Even in India January month is celebrated as cervical cancer awareness month.

Mostly the cervical cancer cases are found to be caused due to sexually transmitted HPVs so taking a vaccine plays a vital role in putting a major impact on reducing the growth of these kind of virus hence controlling the rapid increase of cervical cancer cases. For better prevention the vaccine should be given before a female actually gets exposed to the virus.

An age group of 9-14 years aged girl individuals are mostly targeted as per the planning of The Union Government for the Cervavac vaccination against cervical cancer. Mainly two doses are required each dose costing Rs 200 to Rs 400. But as per WHO girls between the age group of 15 to 20 years should take one to two doses of any standard cervical vaccine and for women older than 21 years should get two doses with a six month interval.

MECHANISM OF ACTION

Its mechanism of action according to IARC-WHO says that the Cervavac vaccine is based on VLP which is similar to Hepatitis B vaccine which provides protection by producing antibodies against the HPV virus L1 protein .

The VLPs then fake to be targeted by the virus, activating the immune system to mobilize and produce antibodies.

The HPV vaccination (quadrivalent) contains L1 VLPs of serotypes 6,11,16, and18.

HPV VACCINE
Protects against Human Papillomavirus strains which cause cervical cancer

Most common cancer
AGED UNDER **35** HPV types 16 and 18 responsible for 75% cervical cancer in Europe

850 die from cervical cancer each year
99% EFFECTIVE VACCINE TARGETS HPV 6 11 16 18

DOSE 1 Girls aged 12-13 School year 8
DOSE 2 6-12 months later

HPV Vaccine to be offered to boys in school in 2019
Currently available from GUM clinics for men having sex with men

Protecting Our Children from HPV Cancers
American Cancer Society Mission: HPV CANCER FREE

HPV vaccination is cancer prevention.
We can help reduce the risk of cancer in our children by helping them make a lifetime of healthy choices.

- Healthy diet
- Physical activity
- Sunscreen
- No tobacco

We can also help prevent most HPV cancers with just 2 shots of HPV vaccine at age 11 or 12.

HPV vaccine is for both boys and girls.
HPV vaccination helps prevent the infections that can cause 6 types of cancers

Don't wait to vaccinate.
Doctors recommend that boys and girls get HPV vaccine at age 11 or 12. Teens who start the series late may need 3 shots.

Age matters. When you vaccinate your child on time, you give them the best protection from HPV cancers. In fact, HPV cancer prevention decreases the longer you wait to vaccinate.

HPV vaccination is safe.
The most common reactions from HPV vaccine are mild and like those of other vaccines.
Scientists and doctors around the world monitor HPV vaccine safety and are confident that HPV vaccination is extremely safe.

Learn more at cancer.org/hpv, and ask your child's doctor for the HPV vaccine.

HPV Vaccine Formulation	Age (Females)	Doses	Schedule
Bivalent vaccine	9–14 *	2 doses	dose 1: 0 mo dose 2: 5–7 mo
	over 14	3 doses	dose 1: 0 mo dose 2 ⁺ : 1 mo dose 3 ⁺ : 6 mo
Quadrivalent vaccine	9–13 *	2 doses	dose 1: 0 mo dose 2 [^] : 6 mo
	9–13 *	3 doses	dose 1: 0 mo dose 2 ^S : 2 mo dose 3 ^S : 6 mo
	14 and over	3 doses	dose 1: 0 mo dose 2 ^S : 2 mo dose 3 ^S : 6 mo
Nonavalent vaccine	9–14 *	2 doses	dose 1: 0 mo dose 2 [^] : 5–13 mo
	9–14 *	3 doses	dose 1: 0 mo dose 2 ^S : 2 mo dose 3 ^S : 6 mo
	over 14	3 doses	dose 1: 0 mo dose 2 ^S : 2 mo dose 3 ^S : 6 mo

mo: month; * included; ⁺ the second dose should be administered 1 to 2.5 months after the first dose, the ^S

OVERVIEW

There are a group of more than 200 closely related viruses against which the Human Papilloma Virus (HPV) provides active immunization. There are more nearly or more than 40 diseases which are transmitted or transferred through intimate contacts. There are specifically two types of HPV kinds of viruses which can cause genital warts and the rest some types of HPV cause cervical, vaginal, vulvar, penile, anal, oropharyngeal malignancies etc

Currently three vaccines namely cervavix which is bivalent, Gardasil which is quadrivalent, and Gardasil 9 which is nonavalent are being provided in various nations around the world to prevent the disease causing HPV as per the reports of the National Cancer Institute of the United States National Institute of Health (NIH).

Gardasil is widely used to prevent the types of HPV strains 6,11,16, and 18 whereas cervavix is used to prevent the HPV types 16, 18 and Gardasil 9 is used to prevent the infection with HPV types 6,11,16,18,31,33,45,52 and 58.

About 70% of cervical malignancies are thought to be due to HPV types 16 and 18 and the rest 10% to 20% of cervical malignancy cases are due to the high risk strains of HPV i.e 31,33,45,52 and 58.

Description/Mechanism

It is a vaccine that is used for the prevention or to minimize the number of cervical cancer cases. Serum institute of India's cervavac is based on VLP (Virus Like Particles) similar to Hepatitis -B vaccine. It protects by generating antibodies against the HPV virus L1 protein. Cervavac is expected to cost much less than two vaccines licensed globally which are currently available in India. Gardasil from Merck and Cervarix from GlaxoSmithKline. A quadrivalent L1 virus like particle (VLP) shows its effectiveness by stimulating an immune response against four different antigens (viruses/micro-organisms) for instance Gardasil (quadrivalent vaccine) protects the body from four different types of HPV infection whereas Gardasil 9 vaccine defences the body against HPV types like 6,11,16,18,31,33,45,52, and 58. For creating a VLP a molecule resembling the virus but should not be contagious i.e the L1 protein is sufficient, these particles act as a very useful method for developing vaccinations against diseases caused by the hepatitis B virus and the different types of HPVs present among others.

Posology

It shows its effectiveness by stimulating an immune response against four different viruses or microorganism. HPV are required to reduce the impact of cervical cancer which caused by sexually transmitted HPVS. It began in 2019 with thousands of participants in the age group of 9 to 26 taking part in the trail. Phase 3 results showed a shining result on immune response in 100% of vaccine recipients with excellent safety records. Less than 10% of Indian women get scanned and the age of 30 to 49 must get screened for cervical cancer.

THERAPEUTIC INDICATION

The aim of the vaccine against HPV is to induce an in-vivo virus-specific T-cell response against established HPV infections and lesions. It is indicated to prevent the following precancerous (dysplastic lesions) caused by HPV types 6,11,16,18,31,33,45,52,and58.

CONTRAINDICATION

The vaccine may show side effects like fatigue, dizziness, nausea, vomiting, headaches sometimes soreness and redness may be seen at the injection site.

DOSE

It is given in two doses and the antibodies that develop after both are administered can last up to 6 or 7 years. It is cheaper than other vaccine to cost approximately Rs 200/- to Rs400/-

Result and discussion

From this general review we found it shows satisfactory immune response against cervical cancer. But there are some certain points which need to be take care of like

- There is a huge need of some awareness programme regarding cervical cancer and cervavac as well
- Can also organise school-based vaccination programme which might put a great impact in community.
- Can organize public health programme by government of India in rural and coastal area too

Reference

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