# A SYSTEMIC REVIEW ON NEWLY DEVELOPED HPVS VACCINE 'CERVAVAC'

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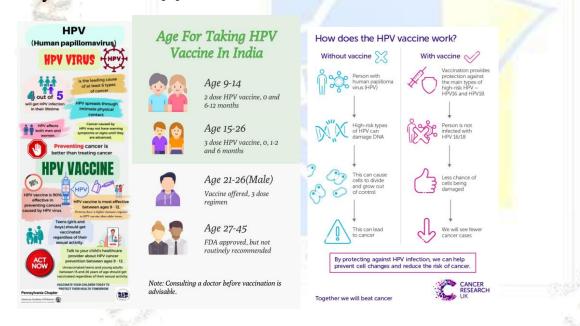
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## **Abstract**

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



## 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.

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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.

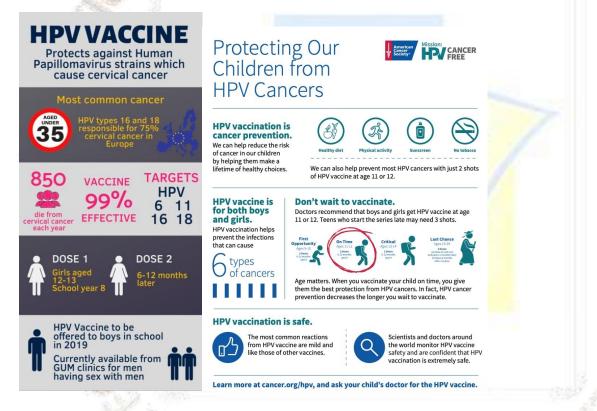
An age group of 9-14 years aged girl individuals are mostly targeted as per the planning of The Union Government for the Cervavac vaccination against cervical cancer. Mainly two doses are required each dose costing Rs 200 to Rs 400. But as per WHO girls between the age group of 15 to 20 years should 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.



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<b>HPV Vaccine Formulation</b>	Age (Females)	Doses	Schedule
	9–14 *	2 doses	dose 1: 0 mo dose 2: 5–7 mo
Bivalent vaccine	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 §: 2 mo dose 3 §: 6 mo
	14 and over	3 doses	dose 1: 0 mo dose 2 <sup>§</sup> : 2 mo dose 3 <sup>§</sup> : 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 <sup>§</sup> : 2 mo dose 3 <sup>§</sup> : 6 mo
	over 14	3 doses	dose 1: 0 mo dose 2 <sup>§</sup> : 2 mo dose 3 <sup>§</sup> : 6 mo

mo: month; \* included; \* the second dose should be administered 1 to 2.5 months after the first dose, the t

# **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

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