

## Analysis of the safety and effectiveness of the HPV vaccine: Comprehensive review

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### ABSTRACT

Cervical cancer has been a serious public health problem in the country, as it is a slowly evolving disease with a high impact on prevalence and lethality rates, especially in women with lower social and economic conditions and who are in the productive period of their lives. It can be triggered by persistent infection by oncogenic subtypes of the Human Papillomavirus, especially 16 and 18. The objective of this narrative review was to analyze and review the main available articles on the safety and effectiveness of the HPV vaccine. It is a comprehensive review of the literature, with narrative synthesis. This methodological type allows for a broader view of a given subject. From this study, it was possible to identify that the HPV vaccine is considered the most effective measure for the prevention of cervical cancer. It is safe, immunogenic, and quite effective. Further studies are suggested in the future to improve understanding, as well as the dissemination of information for health promotion.

**Keywords:** Cervical cancer, HPV, Vaccine, Effectiveness.

### INTRODUCTION

Cervical cancer, also called cervical cancer, is a malignant neoplasm triggered by the disorganized growth of cells that cover the epithelium of the organ, which can affect nearby structures and other organs. With regard to epidemiology in Brazil, in 2022, 16,710 new cases were estimated, which shows a risk of 15.38 cases per 100 thousand women (BRASIL, 2021).

Cervical cancer can be triggered by persistent infection with oncogenic subtypes of the Human Papillomavirus (HPV), mainly HPV-16 and HPV-18. There is a projection that 80% of sexually active

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women will contract this infection in the course of their lifetime. This neoplasm may be associated with other risk factors, for example, exposure to the infectious agent *Chlamydia trachomatis* and the Human Immunodeficiency Virus (HIV), smoking, use of oral contraceptives for a long time, and multiparity (BARROS et al., 2021).

Thus, considering the negative impact that this disease has on the person, family and community, as well as the importance of cervical cancer prevention and screening in order to promote health and quality of life, this study is justified, whose objective was to analyze and review the main available articles on the safety and effectiveness of the HPV vaccine.

## **METHODOLOGY**

It is a comprehensive review of the literature, with narrative synthesis. This methodological type allows for a broader view of a given subject. In this way, it identifies trends, gaps and future directions in the field of study (VOSGERAU; ROMANOWSKI, 2014). In view of this, it includes six stages, namely: 1) choice of theme; 2) literature search; 3) selection of sources; 4) cross-sectional reading; 5) writing and; 6) references (SOUSA et al., 2018).

## **LITERATURE REVIEW**

### **CERVICAL CANCER**

Cervical cancer is a malignant neoplasm located in the epithelium of the uterine cervix, resulting from cellular modifications that will change imperceptibly, ending in invasive cervical cancer. It is characterized by the unregulated replication of the organ's lining epithelium, compromising the underlying tissue (stroma) and being able to penetrate contiguous or distant structures and organs. There are two main categories of invasive carcinomas, depending on the origin of the affected epithelium: squamous cell carcinoma, which is the most incident and affects the squamous epithelium (represents about 80% of cases), and adenocarcinoma, which is rarer and affects the glandular epithelium (10% of cases) (CERQUEIRA et al., 2022).

Risk factors related to cervical oncogenesis are divided into two types: experimentally documented and clinical or epidemiological. Among those classified in the first species, immunological factors (local and humoral immune response), the relationship with AIDS, genetic factors (such as the polymorphism of the p53 protein), smoking, and the constant use of oral contraceptives can be mentioned. In the second, early sexual activity, multiplicity of partners, lower level of education and income, report of Sexually Transmitted Infection (STI) and multiparity stand out. In addition, HPV infection is presumed to be a necessary factor for the development of cervical cancer (DROKOW et al., 2021).



## PRIMARY PREVENTION

It is known that the primary prevention of cervical cancer is associated with a decreased risk of HPV infection. This virus is transmitted sexually, through microscopic abrasions on the mucosa or skin of the anogenital region. Consequently, the use of condoms during penetrative sex partially protects against HPV contagion, since it can also happen through contact with the skin of the vulva, the perineal and perianal region, and the scrotum (NASCIMENTO et al., 2024).

Currently, there are three licensed and commercially available vaccines: the bivalent, which offers protection against oncogenic types 16 and 18, the quadrivalent, which protects against non-oncogenic types 6 and 11 and oncogenic types 16 and 18, and the nonavalent which confers protection against types 6, 11, 16, 18, 31, 33, 45, 52 and 58. All three are effective against precursor lesions of cervical cancer, especially if used prior to contact with the virus. The benefits are achieved before the beginning of sexual life. In addition, it is necessary to mention that there is no difference in efficacy between vaccines with regard to the prevention of cervical intraepithelial lesions (BRASIL, 2024).

The HPV vaccine is recognized as being safe and very effective in preventing the unfavorable outcomes of HPV virus infection. Consequently, countries with high vaccination coverage recorded a decrease in the risk of cervical cancer by more than 80% and almost eliminated genital warts (BARNABAS et al., 2022).

In this scenario, Restrepo et al. (2023) stated that after the introduction of HPV vaccines in several countries around the world, there was a decrease in prevalence, as well as a reduction in the rates of high-grade cervical lesions and invasive cervical cancer. Accumulated safety data from large post-marketing surveillance and epidemiological studies converged with the safety profile of clinical trials. This finding continues to support the benefit of this immunobiological.

## FINAL CONSIDERATIONS

From this study, it was possible to identify that the HPV vaccine is considered the most effective measure for the prevention of cervical cancer. It is safe, immunogenic, and quite effective. In this scenario, it is appropriate to mention that the health professional needs to know the reality of the population in order to plan actions capable of reversing the situation found and acting on what hinders the promotion and prevention of this disease. To this end, it must develop effective means that facilitate access to preventive measures, so that the rates of this neoplasm can be minimized and contribute significantly to the quality of life of people, families and communities.



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