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Uterine cancer in adolescent women vaccinated against HPV vs. unvaccinated women / Cáncer uterino en mujeres adolescentes vacunadas contra el HPV vs no vacunadas

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ABSTRACT

Through a systematic review of the literature published in the National Ministry of Health, Boletín epidemiológico and PubMed, this paper analyzes the importance of incorporating the vaccine against high-risk oncogenic HPV genotypes as a preventive measure for uterine cancer in young sexually active women. It compares the decrease in the number of cases in Argentina with other countries.

Keywords: Human Papillomavirus; Uterine Cancer; HPV Vaccine.

RESUMEN

Mediante una revisión sistemática a través de la literatura publicada en el Ministerio de Salud de la Nación, Boletín epidemiológico y PubMed. En este trabajo analiza la importancia de la incorporación de la vacuna contra los genotipos de alto riesgo oncogénico del VPH como medida de prevención del cáncer uterino en mujeres jóvenes sexualmente activas. Compara la disminución de casos tanto en la Argentina con otros países.

Palabras clave: Virus del Papilloma Humano; Cáncer Uterino; Vacuna Contra el VPH.

INTRODUCTION

Cervical cancer ranks fourth in terms of mortality, according to a report by the National Cancer Institute. Approximately 4500 new cases are diagnosed each year, and an estimated 2300 women die annually from this disease.(1)

It is estimated that 80 % of sexually active individuals, both men and women, will come into contact with this virus at some point in their lives. For this reason, the development of a vaccine against HPV was essential to reduce the incidence and mortality of cervical cancer.(2)

In 2011, Argentina added the bivalent vaccine (against HPV genotypes 16 and 18) to the National Vaccination Schedule for 11-year-old girls born in 2000 or later.(3)

Given the strong link between cervical cancer and human papillomavirus (HPV) infection, the objective of this study is to review the efficacy of the HPV vaccine, which is included in the national vaccination schedule, and its impact on the prevention of these infections.

HPV belongs to the Papillomaviridae family and is characterized by being a double-stranded

circular DNA virus, which has no envelope and presents an icosahedral capsid made up of two structural proteins: the major protein L1 and the minor protein L2.[4] These are classified into genotypes according to their cancer risk. While HPV genotypes 6 and 11 are characterized as low cancer risk, genotypes 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, and 59 are high-risk types associated with cervical, anal, vaginal, vulvar, penile, and oropharyngeal cancer.[5] About cervical cancer, the most common high-risk genotypes are HPV 16 and 18, which are responsible for approximately 70 % of cases of this disease worldwide.[6]

In the mid-1980s, German virologist Dr. Harald zur Hausen demonstrated that cervical cancer is associated with HPV by isolating HPV16 and 18 in cervical samples. In his work, he showed the incorporation of viral genes into the host cell's DNA. He later showed that HPV is also associated with anal, penile, vulvar, vaginal, and oropharyngeal cancer.[7] In 1991, researchers Ian Frazer and Jian Zhou from the University of Queensland (Australia) succeeded in assembling virus-like particles (VLPs) with antigenic capacity from the coating that protects the double strand of DNA, enabling the development of current vaccines.[8] The Cervarix vaccine (GlaxoSmithKline) is a bivalent recombinant vaccine prepared from the L1 protein of the high-risk HPV16 and HPV18 genotypes, produced using recombinant DNA technology.[9] Gardasil (Merck & Co.) is a recombinant, tetravalent vaccine prepared from highly purified virus-like particles (VLPs) composed of the recombinant major capsid protein (L1) of HPV types 6, 11, 16, and 18.[10] Gardasil 9 (Merck & Co.) is a recombinant, nonavalent vaccine prepared from highly purified VLPs of the major capsid protein L1 of the same four HPV types (6, 11, 16, and 18) as in the Gardasil vaccine and from 5 additional HPV types (31, 33, 45, 52, 58).[11]

In 2014, the National Calendar transitioned to the quadrivalent vaccine (genotypes 6, 11, 16, and 18). It was incorporated for both males and females between the ages of 11 and 26 living with HIV and for transplant patients.[12]

In 2024, the nonavalent vaccine (genotypes 6, 11, 16, 18, 31,33, 45, 52, 58) was added for people aged 11 to 20 years inclusive.[12]

Justification

To analyze the importance, in the population, of incorporating the vaccine against high-risk HPV genotypes into the national vaccination schedule for the prevention of cervical cancer. To document the decrease in cases in the vaccinated population.

Research question

Following the inclusion of the HPV vaccine in the national schedule: Has cervical cancer significantly decreased in sexually active young women?

Literature Search Strategy

Research studies published in PubMed and information obtained from the Ministry of Health of the Argentine Republic will be used.

General Objective

To analyze the impact of HPV vaccination in sexually active women and compare these results with those of other countries (Paraguay, Brazil, and Colombia; Germany and England).

METHOD

This study will consist of a systematic review based on the archives of the Ministry of Health

of the Nation, the Epidemiological Bulletin, and PubMed. The review will not only search for data from Argentina, but will also compare it with data from other countries.

Bibliographic Search Strategy

Research studies published in PubMed and information obtained from the Ministry of Health of the Argentine Republic will be used.

Study population

Sexually active young women between the ages of 15 and 25 who have been vaccinated and those who have not been vaccinated since the vaccine was added to the national schedule.

Inclusion criteria

Publications that include data on cervical cancer in young women aged 15 to 25 who have been vaccinated against HPV.

Publications that include data on cervical cancer in young women aged 15 to 25 who have not been vaccinated against HPV

Exclusion Criteria

- Articles that are duplicates.
- Articles published more than seven years ago.

Scope of the study

The scope of the survey will be epidemiological.

Data collection tool(s)

Review of published literature on the subject.

Resources required

- Scientific literature and updated epidemiological bulletin.
- Internet and Word.

DEVELOPMENT

González's article shows that in Argentina, of all the unvaccinated women included in the study, 56,3 % had uterine cancer. However, among those vaccinated, the percentage of this pathology decreased by more than 93 %, demonstrating the importance of HPV vaccination in the population, as reflected across different countries.

In Bobadilla's[13] 2023 article conducted in Paraguay, 54,8 % of the unvaccinated study population tested positive for any HPV, of which 42,3 % were high-risk types. However, in 2024, after vaccination, that percentage dropped to 19,2 %, and there is still a need to raise public awareness of vaccination benefits.

Regarding Wendland's[14] 2021 article, it was demonstrated in Brazil that women with a higher socioeconomic status had the highest vaccination rates. In addition, the post-vaccination study population had a decrease in the percentage of uterine cancer, specifically 56 %. In Checchi's 2023 article, it was shown that uterine cancer rates decreased by more than 87 % post-vaccination compared with unvaccinated women, driven by increased vaccination coverage.

In Loenenbach's[15] 2023 article, the prevalence of uterine cancer in the post-vaccination study population in Germany decreased by approximately 50 % compared to unvaccinated women. Therefore, it should be emphasized that vaccination should be completed before the onset of sexual activity.

In Combita's[16] 2022 article, Colombia showed a reduction in prevalence during the first five years after the introduction of the vaccine in sexually active young women compared to those who were not vaccinated.

Furthermore, in Reuschenbach's 2023 article, a study was conducted on women undergoing excisional treatment who received the vaccine before treatment, showing a lower prevalence of HSIL than in women who received it after treatment.

Despite the development of vaccines against this virus, the World Health Organization predicts a 16,9 % increase in the incidence of cervical cancer and a 21,1 % increase in the mortality rate by 2030 worldwide due to limited access to preventive health services and treatment in some regions of the world.

According to Amiri's 2025 article, uterine cancer has a higher incidence and mortality rate in low- to middle-income countries such as sub-Saharan Africa, Southeast Asia, and Central America. This is due to inadequate access to HPV vaccination and screening programs.

CONCLUSIONS

The vaccine has proven to be the most effective and recommended method for preventing uterine cancer, according to several studies conducted in different countries where the prevalence of high-risk oncogenic genotypes has decreased.

Although in Argentina it was initially intended for women, it is now available to both men and women at an early age, but this may vary in the future depending on the population's sexual development.

In addition to the vaccine, other preventive measures for sexually transmitted diseases, such as the correct use of condoms, should also be implemented.

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FINANCING

None.

CONFLICT OF INTEREST

None.

AUTHORSHIP CONTRIBUTION

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