Epidemiologic Evidence: Effectiveness and Safety of the HPV Vaccine

What's known

Data have shown that HPV vaccination is safe and effective in preventing precancers and genital warts.

Evidence from clinical trials has led to the recommendation for routine provision of the 9-valent HPV (9vHPV) vaccine starting at age 9 years.[1]

No new safety concerns have been observed in data from post-licensure safety studies of 9vHPV vaccination.[2]

What's new

Data from long-term observational studies continue to confirm the effectiveness and safety of HPV vaccination.

HPV vaccine effectiveness

- In the United States, cervical cancer incidence in young women (ages 20-24 years) decreased by 65% from 2012 to 2019. These women were among the first cohort of adolescents to receive the HPV vaccine. As vaccinated women age, the protective effect is carried forward into older age groups; for women ages 25-29 years, cervical cancer incidence dropped 6.8% per year from 2016 to 2019.[3]
- Vaccine-type HPV infections have decreased by 81% for women in the United States ages 20-24 years and 88% for those ages 14-19 years. These declines also occurred in unvaccinated women, offering evidence of community protection (i.e., herd immunity) from HPV vaccination.[4]
- Recent systematic analyses of the impact of HPV vaccines on oral HPV infection identified a significant decrease in oral HPV infections in vaccinated participants (range 72%-93%).[5,6]
- A 70% reduction in high-grade anal precancers and cancers among women who received the HPV vaccine before age 17 years has been reported.[7]
- Multiple international studies indicate that a single dose of HPV vaccine may be effective for cervical cancer prevention.[8]

HPV vaccine safety

- In 2019, the Vaccine Adverse Event Reporting System issued a post-licensure safety report on the 9vHPV vaccine. Researchers reviewed 7,244 reports following HPV vaccination from 2014-2017 and did not detect any novel or unanticipated safety concerns.[2]
- A 2022 study demonstrated that the 9vHPV vaccine is safe over long periods of time and is not linked to severe health events.[9]
    - The research built on the work of a 2019 study using data from the Vaccine Safety Datalink, which assessed the safety of the 9vHPV vaccine in individuals ages 9-26 years over a five-year period.[2]
    - Risk of three health events (Guillain-Barré syndrome, chronic inflammatory demyelinating polyneuropathy, and stroke) was compared to the risk of those same events following administration of other vaccines commonly given to the targeted age group (Tdap, MenACWY, hepatitis A, and varicella vaccines).
    - A statistically significant increase of risk for these events was not found after 9vHPV vaccination.

What's next

In the years to come, research studies aim to demonstrate more clearly the impact of HPV vaccination on cancer incidence rates.

- Of particular interest is whether studies will further elucidate the impact of HPV vaccination status on oropharyngeal cancer prevalence, an important clinical target given that no routine screening test exists for this HPV cancer.[6]
- Additional data are being collected to document the reduction of HPV infections and HPV precancers among individuals ages 27-45 years following updated vaccine approval, and the long-term effectiveness of two-dose or single-dose HPV vaccine regimens.

References

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