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One dose of HPV vaccine may be enough to prevent cervical cancer

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Women vaccinated with one dose of a human papillomavirus (HPV) vaccine had antibodies against the viruses that remained stable in their blood for four years, suggesting that a single dose of vaccine may be sufficient to generate long-term immune responses and protection against new HPV infections, and ultimately cervical cancer, according to a study published in *Cancer Prevention Research*, a journal of the American Association for Cancer Research.

"The latest *Morbidity and Mortality Weekly Report* from the Centers for Disease Control and Prevention on vaccination coverage indicates that in 2012, only 53.8 percent of girls between 13 and 17 years old initiated HPV vaccination, and only 33.4 percent of them received all three doses," said Mahboobeh Safaeian, Ph.D., an investigator in the Division of Cancer Epidemiology and Genetics at the National Cancer Institute (NCI) in Bethesda, Md.

"We wanted to evaluate whether two doses, or even one dose, of the HPV 16/18 L1 VLP vaccine [Cervarix] could induce a robust and sustainable response by the immune system," she added. "We found that both HPV 16 and HPV 18 antibody levels in women who received one dose remained stable four years after vaccination. Our findings challenge previous dogma that protein subunit vaccines require multiple doses to generate long-lived responses."

Data for this study are from the NCI-funded phase III clinical trial to test the efficacy of Cervarix in women from Costa Rica. About 20 percent

of the women in the study received fewer than three doses of the vaccine, not by design.

The researchers looked for the presence of an immune response to the vaccine (measured by antibody levels) in blood samples drawn from 78, 192, and 120 women who received one, two, and three doses of the vaccine, respectively, and compared the results with data from 113 women who did not receive vaccination but had antibodies against the viruses in their blood because they were infected with HPV in the past.

They found that 100 percent of the women in all three groups had antibodies against HPV 16 and 18 in their blood for up to four years. Antibody levels were comparable for women receiving two doses six months apart and those receiving the full three doses.

The researchers also found that while antibody levels among women who received one dose were lower than among those who received the full three doses, the levels appeared stable, suggesting that these are lasting responses. In addition, the levels of antibodies in women from the one- and two-dose groups were five to 24 times higher than the levels of antibodies in women who did not receive vaccination, but had prior HPV infection.

"Our findings suggest promise for simplified vaccine administration schedules that might be cheaper, simpler, and more likely to be implemented around the world," said Safaeian. "Vaccination with two doses, or even one dose, could simplify the logistics and reduce the cost of vaccination, which could be especially important in the developing world, where more than 85 percent of cervical cancers occur, and where cervical cancer is one of the most common causes of cancer-related deaths."

In some parts of the world, including Chile and British Columbia, two

doses of HPV vaccine is now the recommended vaccination program, according to Safaeian. But for a single HPV dose, "while our findings are quite intriguing and show promise, additional data are needed before policy guidelines can be changed," she clarified. "For instance, it is important to note that persistence of antibody responses after a single dose has not been evaluated for Gardasil, the quadrivalent HPV vaccine that is more widely used in the United States and many other countries."

Provided by American Association for Cancer Research

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