

HPV vaccine provides significant protection against cervical abnormalities

March 4 2014

The HPV vaccine offers significant protection against cervical abnormalities in young women, suggests a paper published in *BMJ* today.

The human papillomavirus (HPV) can cause warts, with some strains causing [cervical cancer](#).

Australia was the first country to implement a publicly funded national vaccination programme in April 2007 and a 'catch-up' programme that ran until December 2009.

Studies have shown that the two HPV vaccines used to vaccinate young women prevent cervical lesions associated with HPV types including vulval and vaginal lesions and [genital warts](#) in women as well as genital warts and high grade anal disease in men.

While clinical trials have demonstrated the effectiveness of the vaccine, little is known about the vaccine's effectiveness when delivered to a broader population. Researchers from Australia therefore looked to measure the effectiveness of the HPV vaccine against cervical abnormalities, four years after implementation in Queensland, Australia. The primary objective was to "estimate the effectiveness of the quadrivalent vaccine in the population of sexually naïve young women with no prior infection".

Data was used from population registers in Queensland for a four year

period following the introduction of the vaccination programme in 2007. The study population included all female Queensland residents who attended for their first ever [smear test](#) between 2007 and 2011.

Two case groups were identified: the 'high grade cases' were women whose smear test and follow up biopsy confirmed a high grade cervical abnormality (precancer) and 'other cases' were women who did not meet the high grade case definition but had other abnormalities. 'Control' status was assigned to all remaining women whose results came back negative following their smear.

In total, 103,353 women were eligible for inclusion: 1062 high grade cases; 10,887 other cases and 96,404 controls. Women in the 'cases' group were older, more disadvantaged and less likely to live in major cities than women in the 'controls' group. 11% of high grade cases, 19% of other cases and 24% of controls were fully vaccinated. Fully vaccinated women were younger at first vaccine dose than partially vaccinated women.

Four years after the introduction of a routine and catch up HPV vaccination programme, the researchers estimate, after adjusting for demographic factors that differed between the groups, that three doses of the vaccine provided 46% protection against high grade cervical abnormalities and 34% protection against other cervical abnormalities in women who had not commenced screening prior to vaccination. The researchers also found that two doses of the vaccine provided 21% protection against both high grade and other cervical abnormalities. There was no significant protection from one dose.

In the population studied, the number of women that need to be vaccinated with three doses in order to prevent one cervical abnormality at first screening round was 125 for a confirmed high grade abnormality and 22 for other abnormalities. They also found that the number needed

to vaccinate to prevent one high grade cervical abnormality was significantly lower among women with a prior screening history than women with no prior screening history. The researchers believe this is because the incidence of high grade abnormalities is higher in this group of women.

The researchers also found that vaccine effectiveness was lower in the population of women who'd had one or more smear tests before their index date (the date of the abnormal smear test) compared with women who had no smear test. This is probably because [women](#) who were already screening were already sexually active, so therefore more likely to be infected with HPV, prior to vaccination. High grade cases in particular were significantly more likely to have had one or more prior tests.

In conclusion, the data suggests a risk reduction of 46% for confirmed high grade cervical abnormalities and 34% for other cervical abnormalities for [young women](#) who were fully vaccinated with the HPV [vaccine](#) prior to their first smear test. The researchers say that "continued observation of this population is necessary to assess the implications for cervical screening recommendations in the coming era of mass vaccination".

More information: Effectiveness of quadrivalent human papillomavirus vaccine for the prevention of cervical abnormalities: a case-control study nested within a population-based screening program in Australia, *BMJ*, 2014.

Provided by British Medical Journal

Citation: HPV vaccine provides significant protection against cervical abnormalities (2014,

March 4) retrieved 1 February 2023 from <https://medicalxpress.com/news/2014-03-hpv-vaccine-significant-cervical-abnormalities.html>

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