An HPV update: vaccination coverage needs to be improved

Vaccination against human papillomaviruses (HPV) is fully subsidised for girls and young women to reduce their risk of cervical cancer and genital warts. Vaccination for boys and young men also provides protection against genital warts, as well as anal and penile cancer, and indirectly provides protection against cervical cancer for any future female partners. However, immunisation rates for females in New Zealand are below target and an action plan has been published to improve vaccination coverage. Recent research suggests that HPV vaccination may provide additional benefits to women during gestation and childbirth.

The benefits of HPV vaccination

Human papillomaviruses (HPV) are small DNA viruses; more than 40 types are reported to be able to infect the anogenital tract.[1] HPV infection is considered to be necessary for the development of cervical cancer;[2] it is associated with over 99% of cervical cancers.[1] Infection with HPV is also associated with approximately 95% of anal, 65% of vaginal, 60% of oropharyngeal and 35% of penile cancers.[1]

Human papillomaviruses are classified according to their ability to increase cancer risk.

- High-risk types include serotypes: 16, 18, 31, 33, 45, 52 and 58; types 16 and 18 are most frequently associated with cervical cancer[1]
- Low-risk HPV serotypes are predominantly associated with warts but can also cause recurrent respiratory papillomatosis; types 6 and 11 are frequently associated with genital warts[1]

HPV infection is common and often occurs shortly after a person becomes sexually active; there is a lifetime risk of infection of more than 80%.[1] Infection by HPV occurs following skin-to-skin contact which allows the virus to penetrate small lesions in the epithelium.[1] From here, the virus infects basal epithelial cells, causing them to produce proteins that slow cellular maturation.[1] Most HPV infections are transient and asymptomatic with no clinical signs.[2] It is reported that more than 90% of HPV infections, of any serotype, clear or become undetectable within two years; this generally occurs in the first six months following infection.[2] In some patients, repeated division of infected cells in combination with viral replication results in the development of warts.[1] The majority of females who are infected with a high-risk serotype do not develop cancer, but in some, cancer will develop decades after the infection.[1] There were 164 women newly registered with cervical cancer in New Zealand in 2013,[3] and approximately 50 women die due to cervical cancer each year.[1] People who use condoms can still become infected with HPV.[1]

The HPV vaccination programme in New Zealand

The HPV vaccination was added to the New Zealand Immunisation Schedule in 2008. It is free for girls and young women until their 20th birthday, as well as for women with HIV infection who are aged under 26 years and for people who have undergone an organ transplant.[1] The funded vaccine, Gardasil, is effective against the high-risk HPV types 16 and 18 as well the low-risk types 6 and 11.[1] The vaccine is not "live" as it is made of virus-like-particles that contain immunogenic protein produced by genetically engineered yeast.[1]

To substantially reduce the incidence of cervical cancer, models predict vaccination coverage needs to be over 70% for females aged 10 – 13 years.[4] The Ministry of Health has set a immunisation target of 75% coverage for all 12-year old girls by December, 2017.[5] Overall the HPV vaccination rate for females born between 1996 and 2000 is 54%, although vaccination rates are higher for Pacific (73%) and Māori females (62%) of the same age.[6]

The optimal age to administer the vaccine to females is before they become sexually active, e.g. 11–13 years.[1] All girls in New Zealand schools are offered HPV vaccination in Year Eight as

HPV vaccination may protect against complications of pregnancy

A recent New Zealand study suggests that HPV infection can adversely affect pregnancies. Therefore HPV vaccination may have additional benefit beyond cancer and genital wart prevention.

Placental HPV infection was analysed in 339 women involved in the Otago Placenta Study who gave birth between 2009-2014; placenta were studied from 232 women with pregnancy complications and 107 women with uncomplicated pregnancies.[7] The cohort included: 305 women of European descent, 13 Māori and Pacific women, five women of Chinese descent and 16 women who identified as mixed ethnicity.[7] Women who had smoked more than ten cigarettes per day were excluded.[7] The group were from a diverse range of socioeconomic backgrounds and had not been vaccinated against HPV.[7] There was no statistically significant difference in the mean maternal age or body mass index (BMI) between the groups of women who were HPV positive and those who were HPV negative.[7] The study was deliberately biased towards pregnancy complications and included: 88 cases of prematurity, 72 cases of idiopathic fetal growth restriction, 44 pregnancies with diabetes and 20 cases of pre-eclampsia.[7]

Evidence of HPV infection was found in the placenta of 100% of women with pre-eclampsia, 95% of women who had diabetes, 92% of women with acute chorioamnionitis, 84% of women who had pre-term births, 81% of women who had intrauterine deaths and 76% of women with fetal growth restriction.[7] Women with uncomplicated pregnancies had an HPV placenta infection rate of 57%; suggesting that HPV infection during pregnancy is not always pathogenic.[7]

Overall, women who had HPV identified in their placenta had babies with lower gestational age at birth compared to women who tested negative for HPV.[7] All of the women who developed pre-eclampsia had placenta that were infected with a high-risk form of HPV.[7] The authors concluded that previous assumptions that HPV infection does not cause adverse outcomes during pregnancy may be incorrect.[7] This study suggests that HPV vaccination may reduce the prevalence of pregnancy complications such as pre-eclampsia, although further work is needed to confirm this. The major limitation of this study was that it was biased towards selection of women with pregnancy complications and is not representative of the community as a whole.

part of a school-based programme or by a general practitioner.[1] The vaccine is given as three doses, ideally at zero, two and six months.[1] There does not appear to be a reduction in vaccine efficacy if the intervals between doses are longer.[1]

Vaccination against HPV is recommended, but not funded, for boys and young men under 20 years, people who are immunocompromised and men who have sex with men.[1]

For further information see: "The HPV vaccination programme: addressing low uptake", BPJ 43 (Apr, 2012)

Recommendations for primary care to improve vaccination rates

In August, 2014, the Ministry of Health held a workshop to discuss strategies to increase HPV vaccination coverage. The agreed outcomes of this workshop were recently published as an action plan. Nurses running school-based vaccination programmes are reminded to liaise with primary care teams to ensure that all girls who have not received all three doses of the HPV vaccination are offered them in their 14th year.[5] It is recommended that as of October, 2015, general practices begin recalling all 14-year old girls who are not fully immunised against HPV.[5] General practices should also have recalls in place for any 12-year old girls who chose to have their HPV vaccination administered by the primary care team.

For further information see: **www.health.govt.nz/system/files/documents/publications/hpv-revitalisation-final.pdf**

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