The (Rapidly) Changing Landscape of HPV Associated Cancer

Maryland State Council on Cancer Control Conference

November 29, 2011
Human Papillomavirus and Rising Oropharyngeal Cancer Incidence in the United States

Oropharyngeal cancer cases in men now outnumbers cervical cancer cases in women
By 2030 there will be four times as many cases of oropharyngeal cancer in men as cervical cancer in women.
HPV associated head and neck cancer is climbing rapidly while smoking related head and neck cancer is declining.
Trends in U.S. Vaccination Rates: Ages 13-17 Yrs

Abbreviations: Tdap = tetanus, diphtheria, acellular pertussis vaccine; MenACWY = meningococcal conjugate vaccine; HPV-1 = human papillomavirus vaccine, ≥1 dose; HPV-3 = human papillomavirus, ≥3 doses.

* Tdap and MenACWY vaccination recommendations were published in March and October 2006, respectively.
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Implications of Current US HPV Vaccination Rates

- Current vaccine uptake in the US is probably too low for herd immunity against the HPV types targeted by the vaccine.

- CDC Advisory Committee on Immunization Practices voted Oct. 25 to upgrade its recommendation for male vaccination from “permissive” to “routine” – age 11-12
  - Current male vaccination rate: 1.4%

- In December, 2010, the FDA approved Gardasil (Merck) for a cancer prevention indication (anal cancer) in males; in 2009, it was approved for prevention of genital warts.
One or two vaccine doses (Cervarix, GSK) can induce 4 years of protection against persistent (6 months) HPV infection with HPV16/18

<table>
<thead>
<tr>
<th>Number of doses</th>
<th>Vaccine arm</th>
<th>Number of women</th>
<th>Number of events</th>
<th>Rate per 100 women</th>
<th>HPV vaccine efficacy % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 doses</td>
<td>Control</td>
<td>3010</td>
<td>229</td>
<td>7.6%</td>
<td>84 (77-88)</td>
</tr>
<tr>
<td></td>
<td>HPV</td>
<td>2957</td>
<td>37</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>2 doses</td>
<td>Control</td>
<td>380</td>
<td>24</td>
<td>6.3%</td>
<td>81 (63-94)</td>
</tr>
<tr>
<td></td>
<td>HPV</td>
<td>422</td>
<td>5</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>1 dose</td>
<td>Control</td>
<td>188</td>
<td>15</td>
<td>8.0%</td>
<td>100 (79-100)</td>
</tr>
<tr>
<td></td>
<td>HPV</td>
<td>196</td>
<td>0</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
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- Similar protection was seen against 12 month persistent infection
- It is unknown whether these results can be extrapolated to Gardasil

Kreimer et al, J Natl Cancer Inst, on-line September 9, 2011
Vaccine costs and doses

- Developing world: the full 3 dose schedule is:
  - expensive (even with tiered pricing)
  - logistically complicated (lack of adolescent vaccine platform)

- Two doses partially overcomes both problems
  - Long-term duration of protection?

- Gardasil is already being given in a two dose schedule in parts of Canada, Mexico
  - based on strong immune responses to two doses in young adolescents
Duane Sewell, M.D. 1967-2011

- Physician Scientist, Associate Professor of Otorhinolaryngology, University of Maryland
- Instrumental in therapeutic HPV vaccine currently in clinical trial.