Improving HPV Vaccination Rates

Cody King
June 2, 2017
Disclosures

None
Objectives

- To increase familiarity with the HPV vaccine in order to better advocate for its use
- To understand the factors contributing to low rates of HPV vaccination in the US
- To describe evidence-based counseling techniques that are effective in increasing HPV vaccination rates
Outline

- Background
  - HPV Vaccine Development
  - Vaccine Effectiveness

- Current HPV Infection and Vaccination Rates

- Factors Contributing to Low Vaccination Rates

- Evidence for Increasing Vaccination Rates
Happy Birthday!
Background

1842: Rigoni Stern, cervical cancer related to sexual activity

1970s: studies testing the hypothesis of HPV as causative agent

1980s: HPV 6/11 isolated from genital warts; HPV 16/18 in cervical cancer

1990s/2000s: epidemiological studies showing higher rates of cancers in those that had HPV
HPV Vaccine Development

- 2006: Quadrivalent (Gardasil)
- 2009: Bivalent (Cervarix)
- 2014: Nonavalent (Gardasil-9)
- 2015: Extended age indication in males (9-26 years)
Overview of Recommendations for HPV Vaccination

- Recommended age 11-12 years old, approved age 9
  - Catch-up vaccination recommended for ages 13-26

- October 2016: ACIP recommends that the vaccine can be administered on a 2-dose schedule
  - Start the first HPV vaccine at age 11-12
  - Second dose given 6-12 months after first dose
  - Minimum of 5 months between
  - Not applicable to those
    - 15 and older
    - Immunocompromised
    - Adolescents that have already received two doses of the vaccine within 5 months of each other
Is it effective?

- 98% of vaccinees will develop antibodies
- Reductions in all disease endpoints (CIN1, 2, 3; AIS, VIN1, 2, 3) irrespective of the causal HPV subtype
- Studies have found that protection lasts for at least 8 years for Gardasil, and at least 9 years for Cervarix
- There is no evidence of waning immunity
Is it effective?

Pre- and post-HPV vaccination rates in 7 different countries and found:

- In countries with female vaccination greater than 50%,
  - Anogenital warts decreased by 61% in girls age 13-19
  - Other non-vaccine types decreased among vaccinated individuals, suggesting cross-protection
  - Anogenital warts decreased in boys younger than 20 and women aged 20-39, suggesting herd effects
- In countries with female vaccination less than 50%,
  - Reductions in HPV 16/18 and in anogenital warts in girls age 20 and younger
  - No evidence of cross-protection or herd effects
One of most studied vaccines in history
Approx. 43,000 participants in the studies on efficacy of HPV vaccine
(includes efficacy trials of hpv4 and hpv9 combined)
HPV Vaccine Safety

- Similar safety to MCV4 and Tdap vaccines

- Pre- and post-licensure data:
  - Syncope
  - Skin infections/local injection site reactions
  - Other adverse events have not been substantiated
The HPV vaccine is
- safe,
- effective,
- and long-lasting
So we have an effective vaccine - what’s the problem?

Estimated vaccination coverage from 2006-2013 among adolescents aged 13-17

- 1 HPV girls: 57%
- 3 HPV girls: 37%
- 1 HPV boys: 34%
- 3 HPV boys: 14%
- MCV4: 77%
(Relatively) Current HPV Infection Rates

- Among adults aged 18-59 in 2013-2014, 45 percent of men and 40 percent of women had genital HPV infection.

- High-risk HPV infection in 25% of men and 20% of women.

- Oral HPV among those age 18-69 in 2011-2014 was 7%; high-risk oral HPV prevalence of 4%.

- These do not include incarcerated, IVDU, or homeless populations.
Vaccination Rates in Washington

- High vaccine exemption rate in Washington (though this graph is in reference to school-required vaccines, these rates can be used as a barometer for HPV vaccine exemption)
Factors Contributing to Low HPV Vaccination Rates
### Top 5 Reasons Parents Give

<table>
<thead>
<tr>
<th>Parents of girls</th>
<th>%</th>
<th>(95% CI)</th>
<th>Parents of boys</th>
<th>%</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of knowledge</td>
<td>15.5</td>
<td>(13.0–18.5)</td>
<td>Not recommended</td>
<td>22.8</td>
<td>(20.6–25.0)</td>
</tr>
<tr>
<td>Not needed or necessary</td>
<td>14.7</td>
<td>(12.5–17.3)</td>
<td>Not needed or necessary</td>
<td>17.9</td>
<td>(15.9–20.1)</td>
</tr>
<tr>
<td>Safety concern/Side effects</td>
<td>14.2</td>
<td>(11.8–16.8)</td>
<td>Lack of knowledge</td>
<td>15.5</td>
<td>(13.7–17.6)</td>
</tr>
<tr>
<td>Not recommended</td>
<td>13.0</td>
<td>(10.8–15.5)</td>
<td>Not sexually active</td>
<td>7.7</td>
<td>(6.4–9.2)</td>
</tr>
<tr>
<td>Not sexually active</td>
<td>11.3</td>
<td>(9.1–13.9)</td>
<td>Safety concern/Side effects</td>
<td>6.9</td>
<td>(5.6–8.5)</td>
</tr>
</tbody>
</table>

**Abbreviation:** CI = confidence interval.

* Analysis limited to parents reporting that they were not likely to seek HPV vaccination for their teen in the next 12 months or were unsure of their HPV vaccination plans.

- Not recommended by 13% of providers for females, 22% for males
- Gender-related barrier
Biases Abound

- Omission Bias: preferring the consequences of not doing something to the consequences of doing something

- Biased assimilation: when presented with inconclusive evidence, individuals draw support from their initial position and form a more extreme opinion
What We Have Here Is a Failure of Communication...

‘Common themes among qualitative studies looking Providers’ Communication:’

- HPV vaccine presented as optional
- Providers expressing mixed or negative opinions about the vaccine
- Providers hesitant to engage in discussion when parents expressed reluctance
- Providers sharing parents’ views that teen was not at risk for HPV
Clinicians underestimate the importance parents place on HPV Vaccine
Evidence for Increasing Vaccination Rates
Outline different styles/techniques that we can use?

- Announcement/declarative statement
- Be a storyteller … not a fact-lister
- Focus on the direct benefit to the child/adolescent
- Make a strong recommendation
Announcement/declarative statement vs Discussion

- Declarative statement can say 1) it works, 2) it’s safe, and 3) I recommend it

- 6-month increases in HPV vaccination coverage were larger for patients in clinics that received announcement training vs patients in control clinics

- Patients in clinics receiving conversation training did not differ from patients in control clinics with respect to changes in HPV vaccination coverage

- May better address omission bias
Better to be a Storyteller than a Fact-lister?

- Brendan Nyhan, Dartmouth: ‘Backfire Effect’
  - study looking at what messages are effective for decreasing misperceptions and increasing vaccine rates
  - found that for some parents, these messages and interventions actually reduced intent to vaccinate
  - better to be storyteller instead of fact-lister? (unfortunately, one of the above interventions did include telling parents a dramatic story about an unvaccinated child who contracted a preventable disease); other studies have found that anecdotes are more likely to sway than data

- Addresses biased assimilation?
Framing the Conversation

- Vaccine Message Framing and Parents’ Intent to Immunize Their Infants for MMR (Hendrix et al 2014): 3 interventions (statement regarding (1) benefit to infant, (2) benefit to society, (3) benefit to both infant and society
  - Stating the benefit to infant increased parental intent to vaccinate the most (though, for adult vaccines, stating the benefit to society has been found to be helpful in increasing rates)
- Make a strong recommendation
Responding to Common Questions

‘Why give the vaccine so early? He’s too young! She’s not sexually active!’

- Must be given before exposure
- How many teens notify their parents that they plan to become sexually active 6-12 months ahead of time?
- More robust immune response in early adolescence

‘Doesn’t this just give the green light for sexual activity?’

- Multiple research studies have shown that getting the HPV vaccine does not make it more likely to start having sex at a younger age  (Bednarczyk Oct 2012 Ped)
Multidisciplinary Approach?

- Evidence for school-based health centers increasing vaccination rates
- Social marketing efforts
- Reminder/recall
- Physician-focused interventions
- Political advocacy?

  - Most states do not require HPV vaccination for school attendance
  - In Washington, bills passed in 2007 and 2015 regarding education materials and HPV vaccine promotion
Take-Home Points

1) The HPV vaccine is safe, effective and long-lasting

2) Low rates of HPV vaccination are related to
   a) Lack of knowledge
   b) Perception that it is not needed
   c) Fear of side effects

3) Interventions:
   a) Think about making an announcement of vaccines due,
   b) Know the data and facts, but don’t forget to engage with emotion
   c) Focus on direct benefit to the child/adolescent
   d) And make a strong recommendation to vaccinate