Oral HPV infection

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Objectives

• Review brief epidemiology of HPV
• Current state of knowledge on HPV and head and neck cancers
• Current vaccine recommendations with update on new HPV 9 vaccine

Disclosures: NONE

Acknowledgement: Dr. Marcia Eustaquio
• Human Papilloma Virus (HPV)
• Over 100 types identified
• 30-40 anogenital types
• High risk types
• Low risk types
15% have current HPV infection (1% genital warts, 4% detected by colposcopy, 10% HPV DNA positive)

That’s just the tip of the iceberg!
An additional 60% have HPV antibodies, which means 75% of the population has been exposed to HPV
High-risk “oncogenic” strains

Types: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68, 73

Cervical cancer (70% caused by types 16 and 18)

Low-risk “non-oncogenic” strains

Types: 6, 11, 42, 43, 44, 55, others

Genital warts (caused by types 6 and 11)

In most cases, HPV is transient and has no clinical manifestations.
Estimated number of new sexually transmitted infections
- United States, 2008

Ages 25+

Ages 15-24

8%
20%
45%
70%
13%

Hepatitis B
HIV*
Syphilis
HSV-2
Gonorrhea
Trichomoniasis
Chlamydia
HPV

Total: 19,000
41,400
55,400
776,000
820,000
1,090,000
2,860,000
14,100,000

TOTAL: 19,738,800

Young people (15-24) represent 50% of all new STIs

*HIV incidence not calculated by age in this analysis

Bars are for illustration only; not to scale, due to wide range in numbers of infections
Estimated number of new and existing (total) sexually transmitted infections

- United States, 2008

<table>
<thead>
<tr>
<th>Condition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>117,000</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>270,000</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>422,000</td>
</tr>
<tr>
<td>HIV</td>
<td>908,000</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>1,570,000</td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>3,710,000</td>
</tr>
<tr>
<td>HSV-2</td>
<td>24,100,000</td>
</tr>
<tr>
<td>HPV</td>
<td>79,100,000</td>
</tr>
</tbody>
</table>

Gender totals do not equal overall total, due to rounding

Bars are for illustration only; not to scale, due to wide range in numbers of infections
Oral Warts
What is the most common type of head and neck cancer?

SQUAMOUS CELL CARCINOMA
Squamous cell carcinoma

- Oral cavity (mouth)
- Oropharynx
- Larynx (voice box)
- Hypopharynx
How common is head and neck cancer?

• 49,260 new cases in the US estimated in 2010.

• 11,480 deaths in 2010

• No change in survival in the last 40 years
What causes head and neck cancer?
Oro-pharyngeal Squamous Cell Cancers

• Incidence increased over the last 3 decades
• Incidence of HPV negative declined by 50% from 1988-2004 (2.0 to 1.0 cases per 100K)

• Incidence of HPV positive OPSCC increased by 225% (0.8 to 2.6/ 100K)
The role of human papillomavirus in nongenital cancers
Proportion of tonsil cancers has risen from 28% in the 1970s to 68% in this decade (>2000)
The New Head and Neck Cancer Patient

Typical: older, smoker, drinker HPV negative

New: typically younger by 10 years non smoker, non drinker. HPV positive

Overall prevalence of HPV in head and neck cancers about 25.9%

Oropharyngeal: 35.6%/HPV 16 86.7%

Oral: 23.5% HPV 16 68.2%

Laryngeal 24.0%/ HPV 16 69.2 %
Fig. 1. Distribution of HPV genotypes in HPV positive tumors (male n522; female n59). Laryngeal cancers
Average Number of Cases of Cancer Attributable to HPV

Source: CDC/cancer/HPV
https://drjengunter.wordpress.com/2015/05/08/the-importance-of-the-hpv-vaccine-in-one-graphic-really
Prevalence of Oral HPV Infection in the United States, 2009-2010

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Oral human papillomavirus (HPV) infection is the cause of a subset of oropharyngeal squamous cell carcinomas (OSCCs). Human papillomavirus-positive OSCCs are associated with sexual behavior in contrast to HPV-negative OSCCs that are associated with chronic tobacco and alcohol use. At least 90% of HPV-positive OSCCs are associated with high-risk (or oncogenic) HPV type 16 (HPV-16), and oral infection confers an approximate 30-fold increase in risk for HPV-positive OSCC.

The incidence of OSCC has significantly increased over the last 3 decades in several countries, and HPV has been directly implicated as the underlying cause. Although the incidence of HPV-negative OSCC declined by 50% in the United States from 1988 to 2004 (from 2.0 cases per 100,000 population) and oral HPV infection followed a bimodal pattern with respect to age, with peak prevalence among individuals aged 30 to 34 years (7.3% [95% CI, 4.6%-11.4%]) and 60 to 64 years (11.4% [95% CI, 8.5%-15.1%]), men had a significantly higher prevalence than women for any oral HPV infection (10.1% [95% CI, 8.3%-12.3%] vs 3.6% [95% CI, 2.6%-5.0%], P < .001; unadjusted prevalence ratio [PR], 2.80 [95% CI, 2.02-3.88]). Infection was less common among those without a history of any type of sexual contact (0.9% [95% CI, 0.4%-1.8%] vs 7.5% [95% CI, 6.1%-9.1%], P < .001; PR, 8.69 [95% CI, 3.91-19.31]) and increased with number of sexual partners (P < .001 for trend) and cigarettes smoked per day (P < .001 for trend). Associations with age, sex, number of sexual partners, and current number of cigarettes smoked per day were independently associated with oral HPV infection in multivariable models.

Conclusion Among men and women aged 14 to 69 years in the United States, the overall prevalence of oral HPV infection was 6.9%, and the prevalence was higher among men than among women.
Prevalence of Oral HPV infection in US, 2009-2010 NHANES Data

- Overall prevalence of oral HPV 6.9%
  - Prevalence:
    - HR HPV 3.7%
    - LR HPV 3.1%
  - Most common HR is 16 highest prevalence at 1.0%

- Men higher prevalence than women (10.4% vs 3.6%)
  - Higher among current smokers and heavy alcohol drinkers
  - Higher among current and former marijuana users
Prevalence of Oral HPV infection
In US, 2009-2010 NHANES Data

Sexual Behaviors:
• 8 fold higher HPV if ever had sex than if never had sex
• Increased with lifetime number of sex partners for any kind of sex
• Higher prevalence if first oral sex at 18 or under

• Modifiable risk factors: Smoking including intensity (20% if smoke >20 cigarettes per day)
• Lifetime sexual partners (prevalence as high as 20% with more than 20 lifetime partners)
Oral HPV may be passed from mouth to genital contact or open mouth kissing but this is only a few studies and results are not conclusive. We do know that partners who have been together for a long time tend to share genital HPV.

http://www.cdc.gov/STD/HPV/STDFact-HPVandoralcancer.htm
Can we help to decrease cancer risk or detect cancers early by screening?
DETECTING ORAL CANCER
A Guide for Health Care Professionals

INCIDENCE AND SURVIVAL
Oral cancer accounts for roughly two percent of all cancers diagnosed annually in the United States. How much that will vary every year and based on the data, some years it could go up to five percent. It's twice as common in men as in women. The most important thing to realize about oral cancer is of those with the disease, 60%-70% of them will detectable symptoms and symptoms of those with the disease. So it's very important to be aware of what's going on in your mouth.

THE IMPORTANCE OF EARLY DETECTION
With early detection and timely treatment, deaths from oral cancer could be prevented. Indeed, 60%-70% of oral cancer cases are detected at an early stage with curative treatment. It is important to know your own history and to learn about the signs and symptoms of oral cancer.

WARNING SIGNS
Two lesions that could be precursors to cancer are leukoplakia (white patch) and erythroplakia (red patch). Although some common causes include tobacco and alcohol use, oral cancer can also be caused by other factors. Oral cancer can also be caused by other factors.

RISK FACTORS

1. Tobacco and Alcohol Use
   - Many cases of oral cancer are linked to cigarette smoking, heavy alcohol use, or the use of both tobacco and alcohol.
   - Oral cancer is more common in heavy smokers and drinkers who have been smoking or drinking for a long time.

2. Viruses
   - The human papillomavirus (HPV) can cause oral cancer, and HPV 16 is linked to about 70% of oral cancers.

3. Age
   - Risk increases with age.

4. Race/Ethnicity
   - The incidence of oral cancer is higher in African Americans than in other racial/ethnic groups.

5. Geographic Location
   - Oral cancer is more common in some parts of the world, such as southern Europe and Asia.

6. Sex
   - Men are more likely to develop oral cancer than women.

7. Family History
   - People with a family history of oral cancer are more likely to develop it.

8. Immune System
   - People with a weakened immune system may be at higher risk for oral cancer.

WHAT YOU CAN DO
A thorough oral and head and neck examination should be a part of any routine medical check-up. It's important to see a doctor who can help you determine if you have a problem.

EXAMINE your own head and neck examination described here:
- TAKE A HISTORY of past and present health status.
- INSPECT your mouth for signs of oral cancer.
- FOLLOW UP to make sure a definitive diagnosis is obtained on any suspicious lesions or symptoms.

THE EXAM
This exam is designed to detect oral and oropharyngeal cancer. It is performed by a doctor who is trained in the examination of the mouth and oropharynx. The exam is done to check for any signs of cancer.

The examination is conducted with the patient seated. Any initial problems are noted. The examination includes the mouth, tongue, and mouth floor examination. It is followed by the intraoral examination.

I. The Extraoral Examination
   - FACE: (Figure 1)
   - PALATE: (Figure 2)
   - LABIAL MUCOSA: (Figures 3 and 4)
   - BUCCAL MUCOSA: (Figures 5 and 6)
   - TONGUE: (Figures 7-14)
   - FLOOR OF MOUTH: (Figure 15)
   - PALATINE: (Figures 16-18)

II. The Intraoral Examination
   - CLINICAL EXAMINATION
     - Homogeneous leukoplakia in the floor of the mouth in a smoker. Biopsy showed hyperkeratosis.
     - Clinically, a keratoklipsis on left bucal mucosa. However, the biopsy showed early squamous cell carcinoma. The lesion is suspicious because of the presence of nodules.
     - Nodular leukoplakia in right commissure. Biopsy showed severe epithelial dysplasia.
     - Erythrokeratoklipsis in left commissure and bucal mucosa. Biopsy showed mild epithelial atypia and caseous with atypical keratinization may turn this type of lesion into a homogenous keratoklipsis.

ORAL LESIONS
Signs and symptoms of oral cancer include:

- Changes in the mouth, such as a sore that doesn't heal.
- A white or red patch that doesn't go away.
- Difficulty swallowing.
- A lump or mass in the neck.

These signs and symptoms should be evaluated by a health care professional. It is important to note any changes in the mouth, especially if they last longer than two weeks. If you notice any of these changes, see a health care professional as soon as possible.

The examination is conducted with the patient seated. Any initial problems are noted. The examination includes the mouth, tongue, and mouth floor examination. It is followed by the intraoral examination.

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Prevention/ Protection?

Buy or Make a Dental Dam
Don’t Talk about SEX!!

HPV CANCER PREVENTION

1. HPV VACCINE IS CANCER PREVENTION
   - HPV vaccine protects against HPV types that most commonly cause anal, cervical, oropharyngeal, penile, vaginal, and vulvar cancers.
   - Every year in the U.S., 27,000 people get cancer caused by HPV.
   - That’s 1 person every 20 minutes of every day, all year long.
   - Most of these cancers can be prevented by HPV vaccine.

2. HPV VACCINE IS RECOMMENDED AT THE SAME TIME AS OTHER TEEN VACCINES
   - Preteens need three vaccines at 11 or 12. They protect against whooping cough, cancers caused by HPV, and meningitis.

3. HPV VACCINE IS BEST AT 11-12 YEARS
   - Preteens have a higher immune response to HPV vaccine than older teens.
   - While there is very little risk of exposure to HPV before age 13, the risk of exposure increases thereafter.

YOU CAN PREVENT CANCER
HPV VACCINE IS THE KEY

KEEP CALM AND GET YOUR ANTI-HPV VACCINE
### HPV Vaccine Recommendations*

<table>
<thead>
<tr>
<th>Population</th>
<th>Age</th>
<th>Recommendation</th>
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<tbody>
<tr>
<td>All Females</td>
<td>11-26</td>
<td><strong>Routine</strong> vaccination with HPV 9 HPV4 or HPV2 (ok as early as 9 yrs old)</td>
</tr>
<tr>
<td>All Males</td>
<td>11-21</td>
<td><strong>Routine</strong> vaccination with HPV4 or HPV 9 (ok as early as 9 yrs old)</td>
</tr>
<tr>
<td>22-26</td>
<td></td>
<td>Permissive recommendation <strong>HPV 4 and HPV 9</strong></td>
</tr>
<tr>
<td>MSM and HIV+ Males</td>
<td>22-26</td>
<td><strong>Routine</strong> vaccination with <strong>HPV 4 and HPV 9</strong></td>
</tr>
</tbody>
</table>

* Irrespective of history of abnormal Pap, HPV, genital warts

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Summary

• HPV is an important co-factor in oropharyngeal cancer and other head and neck cancers
• HPV related oropharyngeal cancer has better prognosis, tends to happen in younger age group than typical head and neck cancers
• Spread can be sexually transmitted and risk seems to be higher with more partners and with smoking
• Prevention is Key and HPV vaccine may be our best tool
BRIDGING
Science & Practice

Building the capacity of health professionals through innovative training and consultation.

Source: www.denverptc.org