Lauren Hynicka, PharmD, BCPS

Home Study Webcast
2 Slides Per Page

ACTIVITY DESCRIPTION
2016 held the highest number of reported mumps cases in more than a decade. The mumps vaccine program was initiated in 1967 which resulted in a 99% decrease in mumps cases in the United States. Many healthcare professionals have not cared for a patient with mumps and as a result may be unaware of the clinical signs and symptoms, transmission and complications. With the number of mumps cases increasing it is important for pharmacists to recognize cases of mumps promptly in order to refer patient for appropriate care and aid in the prevention of an outbreak.

TARGET AUDIENCE
The target audience for this activity is pharmacists, pharmacy technicians and nurses in hospital, community, and retail pharmacy settings.

LEARNING OBJECTIVES
After completing this activity, the pharmacist will be able to:
- Describe the epidemiology of mumps
- Recognize the clinical features of mumps
- Identify who should receive the MMR vaccine

After completing this activity, the pharmacy technician will be able to:
- List 3 clinical features of mumps
- Identify which vaccine can prevent the spread of mumps
- List the patient populations who are more likely to be infected with mumps

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ACTIVITY TYPE
Knowledge-Based Home Study Webcast

FINANCIAL SUPPORT BY
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ABOUT THE AUTHOR
Dr. Hynicka is an assistant professor of pharmacotherapy at the University of Maryland School of Pharmacy and has served as a clinical pharmacy specialist on a general internal medicine team at the University of Maryland Medical Center for six years. She has also established pharmacy services in a viral hepatitis C clinic. She received her doctor of pharmacy degree from the University of Pittsburgh School of Pharmacy in Pittsburgh, PA. She then completed residencies in Pharmacy Practice and Internal Medicine at the Virginia Commonwealth University Health System in Richmond, VA. In addition to her areas of practice, her other interests include infectious disease, immunology, hepatology and chronic renal failure.

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The Mumps Resurgence: What, How, Why, When and What Now?

Faculty: Lauren M. Hynicka, Pharm.D., BCPS

Mumps: Background/History

- Acute viral illness caused by paramyxovirus
- Single-stranded RNA virus
- Transmission via contact with respiratory secretions, saliva or fomites (droplets)
- Replication occurs in the nasopharynx and regional lymph nodes and spreads to multiple tissues
- Temporal pattern: incidence peaks predominantly in late winter and spring
- Inactivated vaccine developed in 1948
- Live attenuated mumps vaccine was licensed in the United States in 1967
Epidemiology

Clinical Features

- Pain
- Tenderness
- Swelling
- Low-grade fever
- Myalgia
- Anorexia
- Malaise
- Headache

Parotitis

https://www.cdc.gov/mumps/outbreaks.html

https://www.cdc.gov/mumps/hcp.html
Clinical Features: Parotitis

- Swelling pushes the ear up and out
- Angle of jawbone may not be visible or felt
- 25% of patients only have one parotid gland swell

www.cdc.gov/mumps/hcp.html

https://phil.cdc.gov/phil/details.asp?pid=130
Time Course

- Mumps incubation period ranges from 12-25 days
- Parotitis typically develops 16 to 18 days AFTER exposure to the mumps virus
- The infectious period is several days before and after parotitis onset
  - Period of isolation is 5 days

Complications

**Prevaccine Era**
- Orchitis (11.6 to 66%)
- Oophoritis (5%)
- Mastitis (31%)
- Pancreatitis (3.5%)
- Unilateral deafness (4.1%)
- Aseptic meningitis
- Encephalitis
- Death (2 deaths per 10,000 cases)

**Post-vaccine Era**
- Complication rates are lower in vaccinated case-patients compared to unvaccinated case-patients
- Orchitis (3.3 to 10%)
- Pancreatitis, deafness and meningitis (<1%)
- No mumps-related deaths
Diagnosis

• Usually based on clinical manifestations

• Laboratory testing
  • rRT-PCR
  • Culture
  • Serology
    • Enzyme immunoassay (EIA)

Vaccination

• Available products:
  • Trivalent MMR (measles-mumps-rubella)
  • Quadrivalent MMRV (measles-mumps-rubella-varicella)

• Prepared in chick embryo

• Effectiveness of the mumps component:
  • 78% (49 to 91%) for one dose
  • 88% (66 to 95%) for two doses

• Duration of Immunity:
  • At least 12 years in the majority or people (74 to 95%)
  • Antibody levels decline with time
Vaccination

- Contraindications
  - Severe allergic reaction to any component
  - Pregnancy
  - Immunosuppression

- Precautions

- Adverse Events
  - Fever
  - Rash
  - Joint symptoms

Vaccination: ACIP Pediatric Immunization Schedule

![Diagram of vaccination schedule]

Vaccination:
ACIP Adult Immunization Schedule

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>AGE-GROUP</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-49 years</th>
<th>50-59 years</th>
<th>60-64 years</th>
<th>≥ 65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoster*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Pneumococal 13-valent conjugate (PCV13)*</td>
<td></td>
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<td></td>
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<td>1 dose</td>
<td></td>
</tr>
<tr>
<td>Pneumococal 23-valent polysaccharide (PPSV23)*</td>
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<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
</tr>
</tbody>
</table>

[1 dose] 1 or 2 doses depending on indication

Outbreaks

- Definition: 3 or more cases linked by time and place
- Typically occur in high transmission settings such as
  - Elementary, middle and high schools
  - Colleges
  - Camps
- Why do outbreaks occur?
  - Vaccine is not 100% effective
  - Immunity wanes with time
Reporting Mumps Cases

Outbreak Investigation

- Collecting tracking information
- Identifying the population affected by the outbreak
- Obtaining accurate and complete immunization histories
- Investigating contacts
- Enhancing surveillance for mumps
Outbreak Control

- Once the population at risk has been defined and transmission setting identified
- Vaccinate persons without evidence of immunity
- Vaccination will not protect someone who is already infected
- Cases are expected to continue for 25 days

Third dose of MMR

- High two-dose vaccination coverage
- Intense exposure settings likely to facilitate transmission
- High attack rates and evidence of ongoing transmission
Vaccination and Mumps Outbreak: an Example

- Outbreak occurs among 1,000 people
- 950 people have been vaccinated and 50 have not been vaccinated
- 30% rate in unvaccinated and 3% rate in vaccinated
  - Unvaccinated are 10 times more likely to develop mumps
- 15 unvaccinated develop mumps and 29 vaccinated develop mumps (44 total sick)
  - More vaccinated developed mumps BUT 95% of the population was vaccinated
- If none of the people had been vaccinated 300 would have developed mumps

Vaccine Effectiveness

Attack rate in unvaccinated group – attack rate in vaccinated group
Attack rate in unvaccinated group
Outbreak in Illinois

Role for social media?

- August 16, 2015: a case of parotitis in a resident of Queens, NYC reported to NYC Department of Health

- Investigation revealed 52 confirmed and probable mumps cases in the Rockaways neighborhood

- NYC Department of Health and Mental Hygiene conducted a Facebook advertisement campaign providing information about mumps and the outbreak

http://www.cdc.gov/mmwr/volumes/66/wr/mm6602a5.htm
Summary

• Mumps is a viral illness

• The classic symptom associated with mumps is parotitis

• The mumps vaccine has decreased the incidence of mumps by 99%

• Waning immunity as well as close contact likely contribute to the outbreaks seen
Exam Questions:

1. Mumps is transmitted via
   a. Contact with respiratory secretions/saliva
   b. Contact with fomites
   c. Contact with blood
   d. A and B
   e. All of the above

2. Outbreaks of mumps have been predominantly seen in
   a. Elementary age students
   b. College students
   c. Individuals over the age of 65
   d. A and B

3. Immunity from the mumps vaccine is thought to fade after
   a. 5 years
   b. 10 years
   c. 15 years
   d. 20 years

4. Which of the following is/are clinical features of mumps?
   a. High fever
   b. Parotitis
   c. Myalgia
   d. B and C
   e. All of the above

5. Parotitis typically develops ____ days after exposure to the mumps virus.
   a. 10 days
   b. 12 days
   c. 16 days
   d. 25 days
6. Complications of mumps in the pre-vaccine era included
   a. Orchitis
   b. Oophoritis
   c. Mastitis
   d. Aseptic meningitis
   e. All of the above

7. A mumps outbreak is defined by
   a. ≥ 3 cases linked by time and place
   b. ≥ 5 cases linking by time and place
   c. ≥ 10 cases linked by time and place
   d. ≥ 20 cases linked by time and place

8. Which of the following statements about outbreak control is/are true?
   a. Cases are expected to continue for 25 days
   b. The mumps vaccine protects someone who is already infected
   c. Everyone in the at risk population should receive the mumps vaccine
   d. All of the above

9. Currently ACIP does not provide formal recommendations for a third dose of mumps vaccine, however, a third dose should be considered when the following conditions is/are met
   a. high 2-dose vaccination coverage rate in the at risk population
   b. Intense exposure settings likely to facilitate transmission
   c. High attack rates and evidence of ongoing transmission
   d. All of the above

10. Which of the following statements about the mumps vaccine is/are true?
    a. It is available as a trivalent vaccine (MMR) and quadrivalent vaccine (MMRV) product
    b. One dose is 99% effective
    c. It is contraindicated in egg allergic patients
    d. None of the above.