THE MENINGITIS EXPERIENCE: A PHYSICIAN’S STORY

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NEISSERIA MENINGITIDIS

- Twelve known serogroups, six of which are responsible for invasive human disease.
  - A, B, C, W, X, and Y
- Although rare in the United States, invasive meningococcal disease (by any serogroup) is a serious illness and life-threatening.
  - Historically low incidence of 0.18 per 100,000
TRANSMISSION OF *N. meningitidis*

- Transmitted by sharing respiratory and throat secretions.
- Typically this is by close, prolonged contact
  - Coughing, kissing, living in same home
- Bacteria does not live long outside of the human body.
**Signs and Symptoms of Meningitis**

- Sudden onset of fever, headache, and neck stiffness.
- Other symptoms include: nausea, vomiting, photophobia, altered mental status.
  - Symptoms can vary in infants and young children.
    - Irritability, poor feeding, bulging fontanelle

- Average incubation period is 4 days, but can range from 2-10 days.
Diagnosis & Treatment

- Initial diagnosis can be made with clinical examination.
- CSF studies and cultures confirm the diagnosis.
  - Meningococcal disease is potentially fatal and should always be viewed as a medical emergency.

- Meningitis is treated with appropriate antibiotic therapy.
  - Even when diagnosed early and appropriate antibiotic therapy is started, 5-10% of cases are fatal.
N. Meningitidis Vaccines

- Quadrivalent meningococcal conjugate vaccine
  - Prevention of serogroups A, C, W, Y
  - Routinely given to patients at age 11 years, with booster at age 16 years.

- Serogroup B meningococcal vaccine
  - MenB-FHbp (licensed in October 2014)
  - MenB-4C (licensed in January 2015)
Meningoococcal conjugate ACWY vaccine

- **MenACWY-CRM**
  - (Menveo)
  - Licensed for use for persons age 2 months and older.

- **MenACWY-D**
  - (Menactra)
  - Licensed for use for persons age 9 months and older.

- Typically administered at age 11-12 years, with a booster dose at age 16 years.
- Specific circumstances or diagnoses may necessitate an alternative schedule/additional doses.
## Serogroup B Meningococcal Vaccine

### MenB-FHbp
- (Trumemba)
- Bivalent vaccine consisting of 2 different binding proteins from subfamilies A & B.
- Licensed for use in persons 10-25 years of age.
- Administered in a 2- or 3-dose series, depending on risk.

### MenB-4C
- (Bexsero)
- Multicomponent vaccine consisting of 3 recombinant proteins from *N. meningitidis* and an outer membrane vesicle.
- Licensed for use in persons 10-25 years of age.
- Administered in a 2-dose series, regardless of risk.
**SEROGROUP B DISEASE**

- 50 to 60 cases annually in the United States in persons 11-24 years of age.
  - 80% of these occur in young adults aged 16-23 years
- Incidence in college students is similar to or lower than the incidence in all 18- to 23-year olds or non-college students.

**TABLE 3 Summary of Cost-effectiveness Analysis of Different Strategies for Adolescent Vaccination, United States**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Cases Prevented, n</th>
<th>Deaths Prevented, n</th>
<th>NNV to Prevent Cases</th>
<th>NNV to Prevent Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series at 11 years</td>
<td>15</td>
<td>2</td>
<td>203,000</td>
<td>1,512,000</td>
</tr>
<tr>
<td>Series at 16 years</td>
<td>28</td>
<td>5</td>
<td>107,000</td>
<td>788,000</td>
</tr>
<tr>
<td>Series at 18 years</td>
<td>29</td>
<td>5</td>
<td>102,000</td>
<td>638,000</td>
</tr>
<tr>
<td>College students</td>
<td>9</td>
<td>1</td>
<td>368,000</td>
<td>2,297,080</td>
</tr>
</tbody>
</table>
**ACIP Recommendation #1**

- **February 26, 2015**
  - *Routine* use of MenB vaccines for persons 10 years and older who are at increased risk of serogroup B meningococcal disease.
    - Persistent complement component deficiencies
    - Anatomic or functional asplenia, including sickle cell disease
    - Healthy persons at risk due to outbreak
  - Category A recommendation
    - Recommendations are made for all persons in an age- or risk-factor-based group
ACIP RECOMMENDATION #2

- June 24, 2015
  - Permissive use of MenB vaccine in healthy adolescents and young adults from age 16-23 years of age (preferred ages, 16-18 years).
    - To provide short-term protection against most strains of MenB, although not at increased risk
  - Routine immunization is not recommended.
  - Category B recommendation
    - Recommendations are made for individual clinical decision making
Other Considerations...

- College freshman (especially living in residence halls) and military recruits are at increased risk of invasive meningococcal disease due to serogroups in MCV4 vaccine.
  - This is not true for serogroup B meningococcal disease.