MEASLES: IT ISN’T JUST A LITTLE RASH

Richa Tandon, MD
Division Director, Infectious Diseases
Roger William Medical Center, Providence, RI

Conflict of Interest Disclosure

I have no conflicts and nothing to disclose

Learning Objectives

• Review the epidemiology and spread of measles
• Recognize the clinical presentation of measles
• Facilitate discussions with anti-vaxxers about measles vaccine
What is Measles?

- Respiratory disease caused by Rubeola virus
- Single-stranded
- Enveloped RNA virus
- Paramyxoviridae family

History of Measles

- 1909: The first known written account of measles
- 1911: Measles became a nationally notifiable disease
- 1943: Dr. Jonas Salk and colleagues licensed the first vaccine for measles
- 2000: Measles was declared eliminated in the U.S.
Measles Cases in 2019

1 person can infect up to 90% of close contacts who are not immune
Infected people can spread measles to others from four days before through four days after the rash appears.

**Clinical Features**

- **Incubation Period:** 7 – 14 days after a person is infected
- **High fever:** 103°F or higher
- **3 Cs:** Cough, Coryza, Conjunctivitis
- **Koplik Spots:** Tiny white spots inside the mouth

*Measles is highly contagious. It spreads when an infected person coughs or sneezes.*

**Measles Is Just a Plane Ride Away**

- Measles is still common in many other countries.
- Unvaccinated travelers continue to get measles in other countries and bring it into the United States. Then they can spread it to others.
- Anyone who is not protected against measles is at risk of getting the disease.
Clinical Features

- 3 – 5 days after symptoms begin, a rash breaks out
- When the rash appears fever spikes to 104°F
- After a few days, the fever subsides and the rash fades

Recognizing the Rash

- Flat red spots → on top of which small raised bumps may also appear
- Starts on face at the hairline; spreads downward to neck, trunk, arms, legs and feet
- Spots may become joined together as they spread from head to rest of the body

Photos of People with Measles

Koplik spots inside the mouth
Measles skin rash
People at High Risk for Complications

- Infants and children aged <5 years
- Adults aged >20 years
- Pregnant women
- People with compromised immune systems, such as from leukemia, HIV infection
Complications

Common complications
- Ear infections
- Diarrhea

Severe complications
- Pneumonia
- Encephalitis

Can cause death: 1 or 2 out of 1,000 people with measles

Measles may cause pregnant non-immune women to give birth prematurely or have a low-birth-weight baby

Long-term complications
- Subacute sclerosing panencephalitis (SSPE)

Subacute sclerosing panencephalitis (SSPE)
- Very rare, but fatal disease of the CNS
- Results from measles acquired earlier in life
- Develops 7-10 years after a person had measles
- Risk of developing SSPE higher for a person who acquires measles at < 2 years of age

Testing
- Measles RT-PCR from nasopharynx or urine
- Serologic test for Measles IgM antibody
- Significant rise in measles IgG by a standard serologic test
- Healthcare providers should report suspected measles cases to their local health department within 24 hours
Treatment of Measles

- Supportive care is the mainstay
- Antiviral therapy not established, occasional use of ribavirin for severe cases (IV)
- Vitamin A deficiency is associated with increased mortality
- Evidence suggests that vitamin A doses of 200,000 IU/day x 2 days reduce severity, mortality, especially if child is < 2 yo

Bichon et al. Case report: Ribavirin and vitamin A in a severe case of measles. Medicine (Baltimore) 2017 Dec;96(50):e9154

PREVENTION

STOP
Do you have Measles symptoms?
- Fever
- Cough
- Runny nose
- Sore and watery “pink” eyes
- Blotchy rash starting on the face

PLEASE put on one of the masks provided on this stand NOW

Alert reception that you are returning to your car, where a doctor will assess you with priority.

MMR Vaccine

<table>
<thead>
<tr>
<th>Disease</th>
<th>1 dose</th>
<th>2 doses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>93%</td>
<td>97%</td>
</tr>
<tr>
<td>Mumps</td>
<td>78%</td>
<td>88%</td>
</tr>
<tr>
<td>Rubella</td>
<td>97%</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Who Should Get Vaccinated

Children
1st dose: 12-15 months of age
2nd dose: 4-6 years of age

Students at post-high school educational institutions with no evidence of immunity*
2 doses separated by at least 28 days

Adults born after 1957 with no evidence of immunity*
At least 1 dose

International travelers with no evidence of immunity*
Infants 6-11 months of age: 1 dose
Children > 12 months of age (including teenagers, adults): 2 doses separated by at least 28 days

Health care workers with no evidence of immunity*
2 doses separated by at least 28 days

*Acceptable presumptive evidence of immunity against measles includes at least one of the following: written documentation of adequate vaccination, laboratory evidence of immunity, laboratory confirmation of measles, or birth before 1957.
Health care worker Immunity

- Immune if born before 1957 (consider titres)
- Immune if born after 1957 and have had 2 doses of MMR (written documentation)
- Titers may be drawn if unsure
- Disease and vaccine confer lifelong immunity
- If immune, pregnant HCP’s may care for children with measles

MMR: Adverse Reactions

<table>
<thead>
<tr>
<th>symptom</th>
<th>incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>5 – 15%</td>
</tr>
<tr>
<td>Rash</td>
<td>5%</td>
</tr>
<tr>
<td>Joint Symptoms</td>
<td>25%</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>&lt; 1/30,000 doses</td>
</tr>
<tr>
<td>Parotitis</td>
<td>Rare</td>
</tr>
<tr>
<td>Deafness</td>
<td>Rare</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td>&lt;1/1,000,000 doses</td>
</tr>
</tbody>
</table>

Vaccine Associated “Measles”

- MMR is a live vaccine → can cause “look-alike” rashes in 5% of vaccines
- Can get transient measles rash 7-10 days after vaccination, fever
- Work up can show Measles IgM + serology
- Not contagious, does not need isolation
PEP for Measles

- MMR vaccine within 72 hours of exposure
- If not administered within 72 hours as PEP should be offered at a later time

IG if given within 6 days of exposure:
- may prevent or minimize the disease
- prevent complications in high risk pts with no e/o immunity (infants, unimmunized pregnant woman, severely immunocompromised pts)

- IG is not used for outbreak control
- DO NOT administer IG and MMR together


Care of the Exposed Patient

- Patient should follow routine immunization schedule
- Pregnant women should receive tetanus vaccine
- Immunocompromised patients should receive MMR

MMR and Autism

- In 1998, Andrew J. Wakefield, et al published a paper in *Lancet*: suggesting a link between MMR vaccine and autism

- This study was subsequently found to be based on falsified results → paper was retracted by the journal, lead author’s medical license was revoked

- Unfortunately, the damage was done → “vaccine hesitancy” → outbreaks of measles

Multiple large studies including a meta-analysis, which involved 1.2 million children, have repeatedly demonstrated that there is no causal link between MMR vaccine and autism.

Vaccine Hesitancy: one of the top 10 threats to global health (WHO)

CDC Tool Kit

www.cdc.gov/measles/toolkit/healthcare-providers.html

CDC Tool Kit
Positive Approach

- Instead of saying “What do you want to do about shots?,” say “Your child needs three shots today.”

- Instead of saying “Have you thought about the shots your child needs today?,” say “Your child needs DTaP, Hib, and Hepatitis B shots today.”

Try, Try, Try Again!

- “I strongly recommend your child get these vaccines today.”

- “...These shots are very important to protect him from serious diseases.”

- “...I believe in vaccines so strongly that I vaccinated my own children on schedule.”

- “...This office has given thousands of doses of vaccines, and we have never seen a serious reaction.”

Resources

Table: Educational Resources for Health Care Providers and Parents

<table>
<thead>
<tr>
<th>Health Care Providers</th>
<th>Centers for Disease Control and Prevention: Measles <a href="http://www.cdc.gov/measles/about.html">www.cdc.gov/measles/about.html</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Children's Hospital of Philadelphia Vaccine Education Center <a href="http://www.chop.edu/centers-">www.chop.edu/centers-</a> programs/vaccine-education-center</td>
<td></td>
</tr>
<tr>
<td>World Health Organization: Measles <a href="http://www.who.int/immunization/topics/measles.html">www.who.int/immunization/topics/measles.html</a></td>
<td></td>
</tr>
<tr>
<td>Immunization Action Coalition <a href="http://www.immunize.org/parents/measures/meas-vaccines.jsp">www.immunize.org/parents/measures/meas-vaccines.jsp</a></td>
<td></td>
</tr>
<tr>
<td>Parents</td>
<td>Centers for Disease Control and Prevention: Immunization Education and Tracking <a href="http://www.cdc.gov/vaccines/pARENTS.html">www.cdc.gov/vaccines/pARENTS.html</a></td>
</tr>
<tr>
<td>Children's Hospital of Philadelphia Vaccine Education Center <a href="http://www.chop.edu/centers-">www.chop.edu/centers-</a> programs/vaccine-education-center</td>
<td></td>
</tr>
</tbody>
</table>

Vaccine for Vaccines www.nationalvaccines.org/home
Take home points

- Resurgence of a preventable disease
- Highly contagious disease
- 3 clinical stages: IP, prodromal, final: rash
- High suspicion, THINK Measles!
- Isolation & Prevention are Key
- Vaccinate vaccinate vaccinate!

References

- CDC Measles. www.cdc.gov/measles/about/history.html
- Resenholt T. Fighting Disinformation With Credible Information About Vaccines. Infectious Disease Special Edition June 2019
- Mandell, Douglas and Bennett’s Principles and Practice of Infectious Diseases: 8th Edition