Measles

By

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Community medicine / 4th class

Epidemiolgy

Measles is an acute, highly contagious viral disease capable of causing epidemics. It is caused by a single-stranded ribonucleic acid (RNA) virus of the genus Morbillivirus and the family Paramyxoviridae.

First described in 7th century. The disease was described by the Persian physician Rhazes in the 10th century as “more to be dreaded than smallpox.”

Measles is extremely communicable, and it is estimated that 90% of non-immune people exposed to an infective individual will contract the disease.

- Before a vaccine was available, infection with measles virus was nearly universal during childhood, and more than 90% of persons were immune due to past infection by age 15 years. Measles is still a common and often fatal disease in developing countries. The World Health Organization estimates there were 142,300 deaths from measles globally in 2018.

- Before the introduction of measles vaccine in 1963 and widespread vaccination, major epidemics occurred approximately every two to three years and caused an estimated 2.6 million deaths each year.
- An estimated 128 000 people died from measles in 2021 – mostly children under the age of five years, despite the availability of a safe and cost-effective vaccine.
- Accelerated immunization activities by countries, WHO, the Measles & Rubella Partnership (formerly the Measles & Rubella Initiative), and other international partners successfully prevented 56 million deaths between 2000–2021. Vaccination decreased measles deaths from 761 000 in 2000* to 128 000 in 2021.

Transmission

- The virus is transmitted from person to person via respiratory droplets produced when infected people cough and sneeze. Virus-containing droplets can remain in the air for several hours, and the virus remains infectious on contaminated surfaces for up to two hours. For this reason, it is very infectious, and one person infected by measles can infect nine out of 10 of their unvaccinated close contacts. It can be transmitted by an infected person from four days prior to the onset of the rash to four days after the rash erupts.

- **Risk group**

Measles can infect anyone of any age, but most of the burden of disease globally is still among children < 5 years of age.

Any non-immune person (not vaccinated or vaccinated but did not develop immunity) can become infected. Unvaccinated young children and pregnant persons are at highest risk of severe measles complications.

Sex Distribution

Both sex are equally affected

- **Seasonal variation**

In endemic, measles disease occurs primarily in late winter and spring.

Reservoir

Humans are the natural hosts and there are no known animal reservoirs.

Portal of entry

Respiratory tract mainly, via conjunctiva could occur

- **Communicability**

Measles is highly communicable, with more than 90% secondary attack rates among exposed susceptible persons in close-contact settings. Measles is considered transmissible from 4 days before through 4 days after rash onset.

The incubation period

From exposure to prodrome averages 11 to 12 days. The time from exposure to rash onset averages 14 days, with a range of 7 to 21 days.

Clinical Features

- The prodrome lasts 2 to 4 days, with a range of 1 to 7 days. It is characterized by fever, which increases in a stepwise fashion often peaking as high as 103°F to 105°F, cough, coryza, and conjunctivitis.
- Koplik spots, present on mucous membranes, are considered to be unique to measles. They occur 1 to 2 days before the measles rash (i.e., during the prodromal period), and appear as punctate blue-white spots on the bright red background of the buccal mucosa.
- The measles rash is a maculopapular eruption that usually lasts 5 to 6 days. It begins at the hairline, then involves the face and upper neck. During the next 3 days, the rash gradually proceeds downward and outward, reaching the hands and feet.

Measles


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- The maculopapular lesions are generally individually distinct but may run together, particularly on the upper body. Initially, lesions blanch (become white or pale) with fingertip pressure. By 3 to 4 days, most do not blanch with pressure. The lesions peel off in scales in more severely involved areas. The rash fades in the same order that it appears, from head to extremities.

- Other symptoms of measles include anorexia and generalized lymphadenopathy.

Complications

- Diarrhea, otitis media, pneumonia, encephalitis, subacute sclerosing panencephalitis, death
- People at high risk for severe illness and complications from measles include:

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

Diagnosis

- health care provider can usually diagnose measles based on the disease's characteristic rash as well as a small, bluish-white spot on a bright red background — Koplik's spot .
- Laboratory testing can confirm the presence of measles virus in a recently vaccinated and potentially exposed individual.
- The most widely used methods for laboratory confirmation of measles are detection of measles virus RNA in nasopharyngeal aspirates, throat swabs, or urine sample.

Treatment

- There is no specific antiviral therapy for measles. Medical care is supportive and to help relieve symptoms and address complications such as bacterial infections.
- Severe measles cases among children, such as those who are hospitalized, should be treated with vitamin A. Vitamin A should be administered immediately on diagnosis and repeated the next day. Its effective in reduce rate of morbidity and mortality. The **WHO** recommended age- specific daily doses are.
- 50,000 IU for infants younger than 6 months of age
- 100,000 IU for infants 6–11 months of age
- 200,000 IU for children 12 months of age and older

prevention

Community-wide vaccination is the most effective way to prevent measles. All children should be vaccinated against measles.

Children should receive two doses of the vaccine to ensure they are immune. The first dose is usually given at 9 months of age. A second dose should be given later in childhood, usually at 15–18 months.

- Antibodies develop in approximately 95% of children vaccinated at age 12 months and over 99% of children who receive 2 doses
- Immunity long-term and probably lifelong in most persons.

- In 2022, 74% of children received both doses of the measles vaccine, and about 83% of the world's children received one dose of measles vaccine by their first birthday.(WHO)

Measles Vaccine Contraindications

- Severe allergic reaction to vaccine component or following a prior dose
- Severe immunocompromise
- Systemic high-dose corticosteroid therapy for 14 days or more
- HIV infection, regardless of immunocompetence status
- Family history of congenital or heredity immunodeficiency in first-degree relatives
- Pregnancy

Thank you