

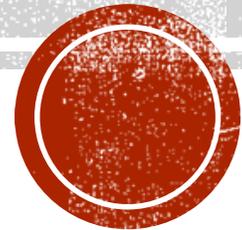
IN THE NAME OF GOD MEASLES

B. SOBOUTI M.D.

PROFESSOR OF PEDIATRIC INFECTIOUS DISEASES

IUMS

2022



ETIOLOGY

- •Measles is caused by the measles virus, a single-stranded, negative-sense, enveloped RNA virus of the genus Morbillivirus within the family Paramyxoviridae.
- Measles is an airborne disease which spreads easily from one person to the next through the coughs and sneezes of infected people. It may also be spread through direct contact with mouth or nasal secretions. It is extremely contagious: nine out of ten people who are not immune and share living space with an infected person will be infected.



CLINICAL FEATURE

- **Measles** is a highly contagious infectious disease caused by measles virus. Symptoms usually develop 10–12 days after exposure to an infected person and last 7–10 days. Initial symptoms typically include fever, often greater than 40 °C (104 °F), cough, runny nose, and inflamed eyes. Small white spots known as Koplik's spots may form inside the mouth two or three days after the start of symptoms.



CLINICAL FEATURE

- Symptoms typically begin 10–14 days after exposure. The classic symptoms include a four-day fever (the 4 D's) and the three C's—cough, coryza (head cold, fever, sneezing), and conjunctivitis (red eyes)—along with a maculopapular rash. Fever is common and typically lasts for about one week; the fever seen with measles is often as high as 40 °C (104 °F).



CLINICAL FEATURE

- Koplik's spots seen inside the mouth are diagnostic for measles, but are temporary and therefore rarely seen. Koplik spots are small white spots that are commonly seen on the inside of the cheeks opposite the molars. They appear as "grains of salt on a reddish background." Recognizing these spots before a person reaches their maximum infectiousness can help reduce the spread of the disease.



CLINICAL FEATURE

- The characteristic measles rash is classically described as a generalized red maculopapular rash that begins several days after the fever starts. It starts on the back of the ears and, after a few hours, spreads to the head and neck before spreading to cover most of the body, often causing itching. The measles rash appears two to four days after the initial symptoms and lasts for up to eight days. The rash is said to "stain", changing color from red to dark brown, before disappearing. Overall, measles usually resolves after about three weeks.



Measles

Other names Morbilli, rubeola, red measles, English measles^{[1][2]}



A child showing a day-four measles rash



DIAGNOSIS

- Typically, clinical diagnosis begins with the onset of fever and malaise about 10 days after exposure to the measles virus, followed by the emergence of cough, coryza, and conjunctivitis that worsen in severity over 4 days of appearing. Observation of Koplik's spots is also diagnostic. Other possible condition that can result in these symptoms include parvovirus, dengue fever, Kawasaki disease, and scarlet fever. Laboratory confirmation is however strongly recommended.



LABORATORY TESTING

- Laboratory diagnosis of measles can be done with confirmation of positive measles IgM antibodies or detection of measles virus RNA from throat, nasal or urine specimen by using the reverse transcription polymerase chain reaction assay. This method is particularly useful to confirm cases when the IgM antibodies results are inconclusive. For people unable to have their blood drawn, saliva can be collected for salivary measles-specific IgA testing. Salivary tests used to diagnose measles involve collecting a saliva sample and testing for the presence of measles antibodies. This method is not ideal, as saliva contains many other fluids and proteins which may make it difficult to collect samples and detect measles antibodies. Saliva also contains 800 times fewer antibodies than blood samples do, which makes salivary testing additionally difficult. Positive contact with other people known to have measles adds evidence to the diagnosis.



COMPLICATIONS

- Complications of measles are relatively common, ranging from mild ones such as diarrhea to serious ones such as pneumonia (either direct viral pneumonia or secondary bacterial pneumonia), laryngotracheobronchitis (croup) (either direct viral laryngotracheobronchitis or secondary bacterial bronchitis), otitis media, acute brain inflammation (and very rarely subacute sclerosing panencephalitis), and corneal ulceration (leading to corneal scarring).
- In addition, measles can suppress the immune system for weeks to months, and this can contribute to bacterial superinfections such as otitis media and bacterial pneumonia. Two months after recovery there is a 11–73% decrease in the number of antibodies against other bacteria and viruses.



COMPLICATIONS

- The death rate in the 1920s was around 30% for measles pneumonia. People who are at high risk for complications are infants and children aged less than 5 years; adults aged over 20 years; pregnant women; people with compromised immune systems, such as from leukemia, HIV infection or innate immunodeficiency; and those who are malnourished or have vitamin A deficiency. Complications are usually more severe in adults. Between 1987 and 2000, the case fatality rate across the United States was three deaths per 1,000 cases attributable to measles, or 0.3%. In underdeveloped nations with high rates of malnutrition and poor healthcare, fatality rates have been as high as 28%. In immunocompromised persons (e.g., people with AIDS) the fatality rate is approximately 30%.
- Even in previously healthy children, measles can cause serious illness requiring hospitalization. One out of every 1,000 measles cases progresses to acute encephalitis, which often results in permanent brain damage. One to three out of every 1,000 children who become infected with measles will die from respiratory and neurological complications.



PREVENTATION

- In developed countries, it is recommended that children be immunized against measles at 12 months, generally as part of a three-part MMR vaccine (measles, mumps, and rubella). The vaccine is generally not given before this age because such infants respond inadequately to the vaccine due to an immature immune system. A second dose of the vaccine is usually given to children between the ages of four and five, to increase rates of immunity. Measles vaccines have been given to over a billion people. Vaccination rates have been high enough to make measles relatively uncommon. Adverse reactions to vaccination are rare, with fever and pain at the injection site being the most common. Life-threatening adverse reactions occur in less than one per million vaccinations (<0.0001%).



PREVENTATION

- In developing countries where measles is common, the World Health Organization (WHO) recommends two doses of vaccine be given, at six and nine months of age. The vaccine should be given whether the child is HIV-infected or not. The vaccine is less effective in HIV-infected infants than in the general population, but early treatment with antiretroviral drugs can increase its effectiveness. Measles vaccination programs are often used to deliver other child health interventions as well, such as bed nets to protect against malaria, antiparasite medicine and vitamin A supplements, and so contribute to the reduction of child deaths from other causes. The Advisory Committee on Immunization Practices (ACIP) recommends that all adult international travelers who do not have positive evidence of previous measles immunity receive two doses of MMR vaccine before traveling, although birth before 1957 is presumptive evidence of immunity. Those born in the United States before 1957 are likely to have been naturally infected with measles virus and generally need not be considered susceptible.



PREVENTATION

- There have been false claims of an association between the measles vaccine and [autism](#); this incorrect concern has reduced the rate of vaccination and increased the number of cases of measles where immunization rates became too low to maintain [herd immunity](#). Additionally, there have been false claims that measles infection protects against cancer.
- Administration of the MMR vaccine may prevent measles after exposure to the virus (post-exposure prophylaxis). Post-exposure prophylaxis guidelines are specific to jurisdiction and population. [Passive immunization](#) against measles by an [intramuscular injection](#) of antibodies could be effective up to the seventh day after exposure. Compared to no treatment, the risk of measles infection is reduced by 83%, and the risk of death by measles is reduced by 76%. However, the effectiveness of passive immunization in comparison to active measles vaccine is not clear.
- The MMR vaccine is 95% effective for preventing measles after one dose if the vaccine is given to a child who is 12 months or older; if a second dose of the MMR vaccine is given, it will provide immunity in 99% of children.
- There is no evidence that the measles vaccine virus can be transmitted to other persons.



TREATMENT

- There is no specific antiviral treatment if measles develops. Instead the medications are generally aimed at treating superinfections, maintaining good hydration with adequate fluids, and pain relief. Some groups, like young children and the severely malnourished, are also given vitamin A, which acts as an immunomodulator that boosts the antibody responses to measles and decreases the risk of serious complications.
- Treatment is supportive, with ibuprofen or paracetamol (acetaminophen) to reduce fever and pain and, if required, a fast-acting medication to dilate the airways for cough. As for aspirin, some research has suggested a correlation between children who take aspirin and the development of Reye syndrome.
- The use of vitamin A during treatment is recommended to decrease the risk of blindness; however, it does not prevent or cure the disease. A systematic review of trials into its use found no reduction in overall mortality, but two doses (200 000 IU) of vitamin A was shown to reduce mortality for measles in children younger than two years of age. It is unclear if zinc supplementation in children with measles affects outcomes as it has not been sufficiently studied. There are no adequate studies on whether Chinese medicinal herbs are effective.



PROGNOSIS

- Most people survive measles, though in some cases, complications may occur. About 1 in 4 individuals will be hospitalized and 1–2 in 1000 will die. Complications are more likely in children under age 5 and adults over age 20. Pneumonia is the most common fatal complication of measles infection and accounts for 56-86% of measles-related deaths.
- Possible consequences of measles virus infection include laryngotracheobronchitis, sensorineural hearing loss, and—in about 1 in 10,000 to 1 in 300,000 cases—panencephalitis, which is usually fatal. Acute measles encephalitis is another serious risk of measles virus infection. It typically occurs two days to one week after the measles rash breaks out and begins with very high fever, severe headache, convulsions and altered mentation. A person with measles encephalitis may become comatose, and death or brain injury may occur.
- For people having had measles, it is rare to ever have a symptomatic reinfection.
- The measles virus can deplete previously acquired immune memory by killing cells that make antibodies, and thus weakens the immune system which can cause deaths from other diseases. Suppression of the immune system by measles lasts about two years and has been epidemiologically implicated in up to 90% of childhood deaths in third world countries, and historically may have caused rather more deaths in the United States, the UK and Denmark than were directly caused by measles. Although the measles vaccine contains an attenuated strain, it does not deplete immune memory.



**THANK YOU
FOR YOUR
ATTENTION**

Adobe Stock | 837948379

