Rubeola Virus

Rubeola virus is a single-stranded RNA paramyxovirus that causes measles. Measles is a syndrome that is distinguished by a fever, Koplik spots, cough, coryza (head cold), conjunctivitis and a characteristic rash. Koplik spots are pathognomonic for measles and present as small red spots with a blue-white center on the buccal mucosa. They usually appear during the prodrome phase or about 48 hours before a rash. The rash found in measles is an erythematous maculopapular rash that begins on the face and moves down to involve the entire body, much like the rash in rubella. However in measles, the rash darkens over time and is confluent (the rash merges together). A rare but fatal complication of measles is subacute sclerosing panencephalitis, which can occur 7-10 years post-infection and is thought to be caused by persistent measles infection in the CNS. In immunocompromised patients, measles can cause pneumonia with Warthin-Finkeldey multinucleated giant cells. Children in the United States are typically vaccinated against measles; however outbreaks are seen in under-vaccinated or unvaccinated children.



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Characteristics

RNA Virus
RNA-rhino
Rubeola is an RNA virus, meaning its genetic code consists of ribonucleic acid as opposed to deoxyribonucleic acid.

Paramyxovirus
Parachute-mixer-virus
Paramyxoviruses are negative-sense single-stranded RNA viruses, which include parainfluenzae, RSV, rubeola (measles), mumps, as well as others.

Signs and Symptoms

Measles
Mustache-weasel
Measles is an exanthem caused by the rubeola virus that is characterized by a fever, red rash that darkens, Koplik spots, cough, coryza and conjunctivitis. Children in the United States are typically vaccinated against measles because cases can result in serious complications and even death.

Rash Spreads From Head to Toe
Spreading Rash on weasels
The rash found in measles is an erythematous maculopapular rash that begins on the face and moves down to involve the entire body, much like the rash in rubella. However in measles, the rash darkens over time and is confluent meaning the rash merges together.

Koplik Spots First
Cop-lick First-finger
Koplik spots are pathognomonic for measles and usually occur during the prodrome phase or about 48 hours before the characteristic rash in measles. They are small red spots with a blue-white center on the buccal mucosa, which is the inside of the cheek near the molars.

Red Spots with Blue-White Center on Buccal Mucosa
Red Spots with Blue-white Center in open Mouth
Koplik spots are pathognomonic for measles and usually occur during the prodrome phase or about 48 hours before the characteristic rash in measles. They are small red spots with a blue-white center on the buccal mucosa, which is the inside of the cheek near the molars.

Cough
Coughing-coffee
A classic clinical feature of measles is the presence of the three C's of cough, coryza and conjunctivitis. The cough in measles usually starts during or after the prodrome phase, which is the initial phase where the patient has a fever and malaise.

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Coryza

Coral-face

A classic clinical feature of measles is the presence of the three C's of cough, coryza and conjunctivitis. Coryza is a term describing a head cold or nasal congestion.

Conjunctivitis

Convict-eye-on-fire

A classic clinical feature of measles is the presence of the three C's of cough, coryza and conjunctivitis. The conjunctivitis found in measles is of variable severity and may also be associated with lacrimation and photophobia.

Subacute Sclerosing Panencephalitis

(SSPE) Sub with Skull-roses and Pan-with-brain-in-flames

Subacute sclerosing panencephalitis is a fatal complication of measles that occurs 7-10 years post-infection. This progressive fibrosis and atrophy is thought to be caused by persistent measles infection in the CNS.

Giant Cell Pneumonia in Immunosuppressed Patients

Giant-shell on Nude-Mona with Band-AIDS

Giant cell pneumonia is a complication of measles that is often found in immunosuppressed patients. Measles infections with pulmonary involvement can predispose patients to developing recurrent respiratory infections and bronchiectasis. A giant cell is formed from the union of several cells (usually macrophages) in order to wall off an infection, such as rubeola virus and tuberculosis. Immunosuppressed patients are at higher risk for infections because their immune system is not able to fight off infection.

Warthin-Finkeldey Multinucleated Giant Cells

Warthog-Fin in Giant Shell

Warthin-Finkeldey giant cells are multinucleated cells found in the lymph nodes or reticuloendothelial system and is considered to be specific of measles. These cells contain from a few to many small nuclei arranged in a grape-like cluster.

Treatment

Vitamin A

Viking (A) Apple

Measles continues to be a major cause of death in children in low-income countries and is especially dangerous in children with a vitamin A deficiency. Vitamin A supplementation during acute measles has been shown to significantly reduce morbidity and mortality although the exact mechanism is unknown.

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