بسم الله الرحمن الرحيم

Short notes (summary) in lecture : Measles, mumps, rubella, rubeola, Parvovirus, and EBV.

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Each infectious disease is described according to:

• ***What is it?***

Basic facts about the infectious disease.

signs and symptoms (not every child will have every symptom of the illness).

Incubation Period

Length of time from when the child is first exposed to the illness to when the first symptoms appear in that child.

• When is the person contagious?

Description of the time period when an infected child is able to spread the illness or infestation to others.

• How is it spread?

Description of how the illness or infestation is passed from child to child.

How to prevent spread of the illness / infestation to other children?

Information regarding whether or not the child needs to be excluded from the school or child care facility.

Strategies to decrease the spread of the illness within the group setting.

• Treatment

Drugs to be given & duration

Handwashing is the best way to stop the spread of infections.

Measles

What is it?

Measles is one of the most contagious communicable diseases. It is caused by the measles virus (paramyxovirus) and is a leading cause of vaccine preventable deaths in children worldwide.

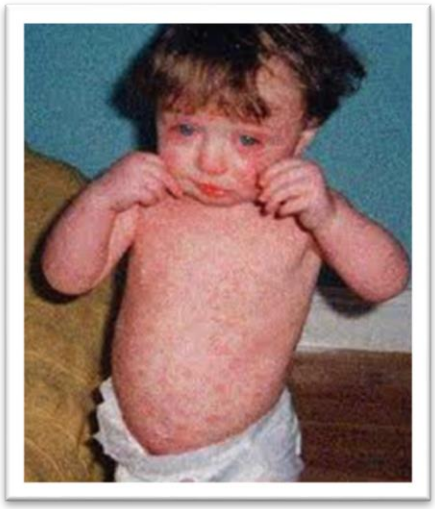
Signs and symptoms of measles may include:

- Fever, cough, runny nose, and watery inflamed eyes.

- Rash , the characteristic measles rash is classically described as a generalized, maculopapular, erythematous rash that begins several days after the fever starts. It starts on the back of ears and, after a few hours, spreads to the head and neck before spreading to cover most of the body, often causing itching.

  The rash is said to "stain", changing color from red to dark brown, before disappearing, The measles rash appears two to four days after the initial symptoms and lasts for up to eight days.

- The classical signs and symptoms of measles include four-day fever and the three Cs — cough, coryza (head cold), conjunctivitis (red eyes).



Koplik's spots seen inside the mouth , it is a small red spots with white or bluish white centers in the mouth , they are pathognomonic (diagnostic) for measles, but are not often seen, even in real cases of measles, because they are transient and may disappear within a day of arising.

How is it spread?

Through the air by droplets that have been coughed, sneezed, or breathed by an infected person.

The measles virus can survive in small droplets in the air for several hours.

Incubation period:

Usually about 10 days. Fever usually develops 7 - 18 days after exposure to infected person. Rash usually develops 14 days after exposure.

When is the person contagious?

From about 5 days before to 4 days after **rash** appears.

How to prevent spread of the illness to other children?

- Exclude child from school, child care, and non-family contacts until 4 days after the rash appears.
- It is recommended that all contacts of a measles case who have not had measles disease or 2 doses of measles vaccine receive measles vaccine within 72 hours of last exposure to the infected child.

- All susceptible contacts should stay away from the child care facility or school until they have received one dose of measles vaccine.
- Immunoglobulin is available to prevent measles disease in people who are exposed to a case of measles but who are unable to be immunized for any reason.

POST-EXPOSURE PROPHYLAXIS:

People exposed to measles who cannot readily show that they have evidence of immunity against measles should be offered post-exposure prophylaxis (PEP) or be excluded from the setting (school, hospital , childcare).

MMR vaccine, if administered within 72 hours of initial measles exposure , or immunoglobulin (IG), if administered within 6 days of exposure, may provide some protection or modify the clinical course of disease.

MMR vaccine as post-exposure prophylaxis:

- If M M R vaccine is not administered within 72 hours of exposure as PEP , MMR vaccine should still be offered at any interval following exposure to the disease in order to offer protection from future exposures .
- People who receive MMR vaccine or IG as PEP should be monitored for signs and symptoms consistent with measles for at least one incubation period.

If many measles cases are occurring among infants younger than 12 months of age, measles vaccination of infants as young as 6 months of age may be used as an outbreak control measure.

Note that children vaccinated before their first birthday should be revaccinated when they are 12 through 15 months old and again when they are 4 through 6 years of age.

Except in healthcare settings, unvaccinated people who receive their first dose of MMR vaccine within 72 hours after exposure may return to childcare, school, or work.

IMMUNOGLOBULIN (IG) AS POST-EXPOSURE PROPHYLAXIS

People who are at risk for severe illness and complications from measles ,such as infants younger than 12 months of age ,pregnant women without evidence of measle immunity ,and people with severely compromised immune systems , should receive IG .

Intramuscular IG) IGIM (should be given to all infants younger than 12 months of age who have been exposed to measles.

Complications:

Complications with measles are relatively common, ranging from the relatively mild and less serious ones like diarrhea to more serious ones such as pneumonia, otitis media, acute encephalitis (rarely SSPE -- subacute sclerosing panencephalitis), and complications are usually more severe in adults who catch the virus.

In immunocompromised patients (e.g. people with AIDS) the fatality rate is approximately 30%.

Risk factors for severe measles and its complications include the following:

- Malnutrition
- Underlying immunodeficiency
- Pregnancy
- Vitamin A deficiency

Diagnosis:

- Clinical diagnosis of measles requires a history of fever of at least three days, with at least one of the three C's (cough, coryza, conjunctivitis). Observation of Koplik's spots is also diagnostic of measles.
- Alternatively, laboratory diagnosis of measles can be done with confirmation of positive measles IgM antibodies or isolation of measles virus RNA from respiratory specimens.
- In patients where phlebotomy is not possible, saliva can be collected for salivary measles-specific IgA testing.
- Positive contact with other patients known to have measles adds strong epidemiological evidence to the diagnosis.

Treatment:

- There is no specific treatment for measles. Most patients with uncomplicated measles will recover with rest and supportive Rx.
- Some patients will develop pneumonia as a sequelae to the measles. Other complications include ear infections, bronchitis, and encephalitis.

  Acute measles encephalitis has a mortality rate of 15%.
- While there is no specific treatment for measles encephalitis, antibiotics are required for bacterial pneumonia, sinusitis, and bronchitis that can follow measles.
- All other treatment addresses symptoms, with ibuprofen, or acetaminophen (paracetamol) to reduce fever and pain and, if required, a fast-acting bronchodilator for cough.
- As for aspirin, some research has suggested a correlation between children who take aspirin and the development of Reye's syndrome.
- The use of vitamin A in treatment has been investigated.

  A systematic review of trials into its use found no significant reduction in overall mortality, but it did reduce mortality in children aged under two years.
- Vaccination of measles in Saudi Arabia started at age of 9 months.

Mumps

What is it?

Mumps disease is caused by the mumps virus. Many children have mild or no symptoms but they are still contagious to others. Adults are more likely to experience complications than children.

Signs and symptoms of mumps may include:

- Fever
- Headache
- Swollen and painful salivary glands (found in front of and below the ear or under the jaw).

The disease is generally self-limiting, running its course before receding.

Complications of mumps disease include:

- Meningitis (inflammation of the lining of the brain) in 20% of people infected.
- Orchitis (inflammation of the testicle) in 20-30% of post-pubertal males.
- Oophoritis (inflammation of the ovary) in 5% of post-pubertal females.
- Deafness and infertility occur occasionally.

Spontaneous abortion in about 27% of cases during the first trimester of pregnancy.

How is it spread?

- Through direct or indirect contact with nose and throat secretions of an infected person.
- Touching the nose and throat secretions of an infected person
- Kissing
- Sharing anything that is put in the mouth (e.g.,cups, toys).

Incubation period:

Usually 16 – 18 days from contact with an infected person but can range from 14 – 25 days.

When is the person contagious?

From 7 days before to 9 days after the onset of **swelling**.

Child is most contagious 2 days before to 4 days after the onset of illness.

How to prevent spread of the illness to other children?

Exclude child from school or child care facility for 9 days after the onset of swelling if there are any unimmunized children.

Carefully dispose of (or clean, if applicable) articles soiled with nose and throat secretions of an infected child.

Diagnosis:

- A physical examination confirms the presence of the swollen glands.
- Usually, the disease is diagnosed on clinical grounds, and no confirmatory laboratory testing is needed.
- If there is uncertainty about the diagnosis, a test of saliva or blood may be carried out; diagnostic confirmation, using real-time, polymerase chain reaction (PCR) technology, has also been used.
- An estimated 20%-30% of cases are asymptomatic.
- As with any inflammation of the salivary glands, serum amylase is often elevated.

Treatment:

- There is no specific treatment for mumps.
- Symptoms may be relieved by the application of intermittent ice or heat to the affected neck/testicular area and by paracetamol (Tylenol) for pain relief.
- Aspirin is not used due to a hypothetical link with Reye's syndrome.

Prognosis:

- Death is very unusual. The disease is self-limiting, and general outcome is good, even if other organs are involved.
- Mumps viral infections in adolescent and adult males carry an up to 30% risk that the testes may become infected (orchitis or epididymitis), which can be quite painful; about half of these infections result in testicular atrophy, and in rare cases sterility can follow.
- Mild forms of meningitis in up to 10% of cases (40% of cases occur without parotid swelling).
- Oophoritis (inflammation of ovaries) in about 5% of adolescent and adult females but fertility is rarely affected.
- Pancreatitis in about 4% of cases, manifesting as abdominal pain and vomiting
- Encephalitis (very rare, and fatal in about 1% of the cases when it occurs)
- Acute unilateral deafness (sensorineural hearing loss) occurs in about 0.005%.

  After the illness, lifelong immunity to mumps generally occurs; reinfection is possible but tends to be mild and atypical.

Rubella (German Measles)

What is it?

An acute disease caused by the rubella virus. An infection with the rubella virus gives lifelong immunity.
Rubella is usually a mild disease in children and adults.

Signs and symptoms of rubella may include:

- Low-grade fever
- Malaise, tiredness
- Raised, red, pinpoint rash that starts on the face and spreads downwards, it lasts 3 – 5 days.

Children with CRS (congenital rubella syndrome) can suffer hearing impairments, eye and heart defects and other lifelong disabilities, including autism, diabetes mellitus and thyroid dysfunction.

How is it spread?

Through contact with the nose and throat and secretions of an infected person:

Touching articles contaminated with secretions form the nose and throat of an infected person.

Kissing or sharing anything that is put in the mouth

Infants with CRS (congenital rubella syndrome) can shed rubella virus in their nose and throat secretions and urine for up to one year.

Incubation period:

Usually 14 – 21 days from contact with an infected person.

When is the person contagious?

From 7 days before until 7 days after the onset of the rash.
A child with rubella is most infectious when the rash is erupting.

How to prevent spread of the illness to other children?

Exclude child from school or the child care facility for 7 days after the onset of the rash.

Fifth Disease (Erythema Infectiosum)

What is it?

Fifth disease is caused by a virus, human **parvovirus B19**.
It is sometimes called "slapped cheek" disease because of the appearance of the rash.

Signs and symptoms of fifth disease may include:

- Flu-like symptoms (e.g., runny nose, sore throat, mild body weakness and joint pain, fever) may be present about 7 days before onset of rash.

- Raised, red rash that first appears on child's cheeks.
  The lace-like rash spreads to the rest of the body after 1 – 4 days, first on torso and arms, and then on to the rest of the child's body.

After the rash fades, it may continue to re-appear for 1 – 3 weeks when child is exposed to sunlight or heat (e.g., bathing).

- At least 50% of adults had fifth disease as a child and won't get it again.

- The disease is usually mild, but in certain risk groups it can have serious consequences:

- In pregnant women, infection in the first trimester has been linked to hydrops fetalis, causing spontaneous miscarriage.

- Fifth disease can be transmitted from a pregnant woman to her unborn baby.
- The baby can get severe anemia that leads to congestive heart failure.

- In people with sickle-cell disease or other forms of chronic hemolytic anemia such as hereditary spherocytosis, infection can precipitate an aplastic crisis.

Incubation period:

Usually 4 – 20 days from contact with infected person

When is the person contagious?

Usually for 7 – 10 days before onset of rash.

Once the rash appears, the child can no longer pass it on to anyone else.

Roseola Infantum ("Sixth Disease")

What is it?

- An acute rash disease caused by a virus.
- There are many viruses that can cause roseola ,the most common virus is human herpesvirus-6 virus.
- Roseola occurs most commonly between the ages of 6 months and 2 years. It is rarely seen after 4 years of age.

Signs and symptoms of roseola may include:

- Fever (usually ≥ 39.5°C) appears suddenly and lasts 3 – 5 days.
- Febrile seizures may occur.
- Swelling of eyelids may occur.
- Rash is rosy – pink rash develops first on neck and chest, and then spreads to rest of the body.

  The spots (rash) turn white if you gently press on them and they may have a lighter color ring around them , the rash usually lasts 1 – 2 days.

- **Rash usually develops as fever is resolving**.

How is it spread?

- Through direct contact with the nose and throat secretions of an infected person.
- Older siblings, caregivers, and parents may spread the disease to infants.

Incubation period:

Usually 10 days from contact with an infected person (range is 5 – 15 days)

When is the person contagious?

An infected child is probably most contagious during the period of high fever, before a rash develops.

The exact duration of infectiousness is unknown. Many adults have the virus present in their saliva (even if they were infected as children) and may spread the disease to infants.

How to prevent spread of the illness to other children?

Exclude child from school or child care facility until fever and rash are gone.

Mononucleosis

What is it?

- Mono is caused by the Epstein-Barr virus (EBV) 85% , also can be caused by cytomegalovirus (CMV), a herpes virus most commonly found in body fluids.
- It is most common in older children and adolescents.
- About half of the people infected with EBV will develop symptoms.
- Mononucleosis is associated with fatigue that can last up to several months. Symptoms are not usually felt until 4–7 weeks after exposure to EBV.

The main symptoms of mononucleosis include:

- Sore throat and tonsils.

- Swollen lymph glands (nodes) in the neck and, less commonly, the armpits and groin area.
- Jaundice (yellow skin and eyes).
- Enlarged spleen and liver, causing abdominal pain.
- Abdominal pain , Headache.
- Chest pain, Skin rashes.

Flu Like symptoms, which include:

Fever and chills (most contagious point)

Nausea ,Coughing.

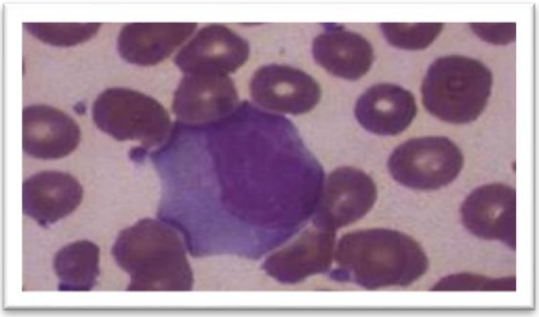
Malaise - A general feeling of unwellness

Loss of appetite and energy

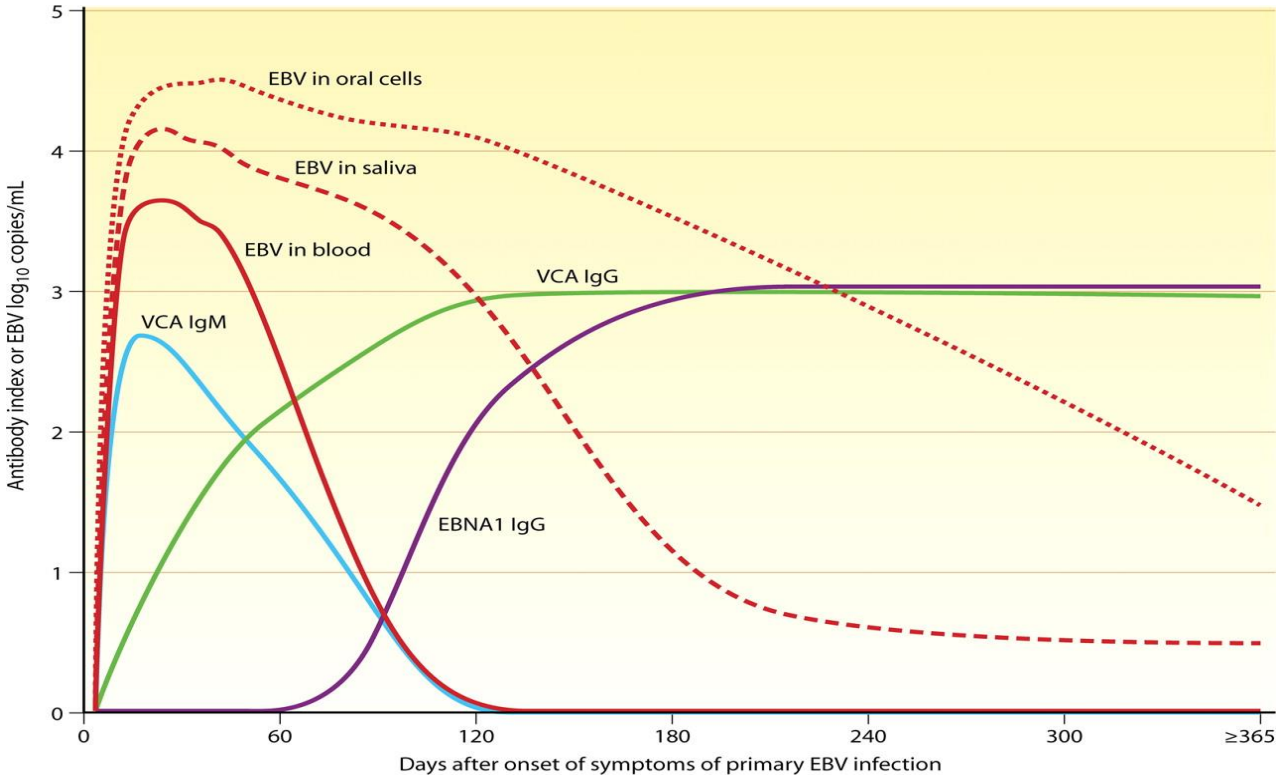
Muscle soreness/aching

Diagnosis:

- Symptoms such as swollen glands in the neck, sore tonsils, exhaustion, and extended lack of energy are easily recognizable as symptoms of mononucleosis
- Monospot test
- An increased number of white blood cells or lymphocytes in the smear of blood can indicate the presence of Mononucleosis.



Test results most likely indicate the following:				
VCA-IgM	VCA-IgG	EA-D, IgG	EBNA, IgG	Possible Interpretation
Negative	Negative	Negative	Negative	No infection, symptoms due to another cause, susceptible to EBV infection
Positive	Positive	Negative	Negative	Early, primary infection
Negative or positive	Positive	Positive	Negative	Active infection, though EA-D IgG may persist for life in about 20% of people
Negative	Positive	Negative	Positive	Past infection
Negative	Positive	Positive	Positive	May indicate reactivation of virus



How is it spread?

- Through direct and indirect contact with the nose and throat secretions of an infected child:
- Kissing
- Sharing anything that children put in their mouths (e.g., toys, sippy cups, food, drinks, soothers)
- Touching something contaminated with an infected person's saliva.

Incubation period :

Usually 4 – 6 weeks from contact with an infected person.

When is the person contagious?

Unclear, but prolonged. The infected child is most infectious when symptoms are at their peak but may remain infectious for up to a year after illness.

How to prevent spread of the illness to other children?

Child may go to school or child care when they feel well enough to take part in activities. This may take 1 – 2 weeks or longer after symptoms develop.

Carefully dispose of (or clean, if applicable) articles soiled with the nose and throat secretions of an infected child.

Treatment:

- There is no specific treatment or therapy for mononucleosis.
- They are also strongly advised to avoid contact sports to reduce the risk of rupturing the enlarged spleen .
- A blow to the abdomen could rupture the spleen, causing severe bleeding and can be life threatening.
- To relieve the sore throat, patients should drink water, non-citrus fruit juices, and eat bland foods.
- Paracetamol has also been shown to help along with high fluid intake.
- Vitamins and minerals play a role in a healthy immune system and may help to prevent EBV infections and reactivations of the virus.
- Studies show vitamin D may help boost the immune response to the virus.
- High-dose vitamin C therapy has also been shown to help clear EBV infections, which may help prevent reactivation.
- Gargling salt water or mouthwash may also relieve pain. Often mononucleosis is accompanied by a streptococcal infection (known as strep throat), which can be treated with antibiotics.
- Normal function should return after 4–6 weeks; however, it may take up to 2–3 months to fully recover pre-disease activity levels.