Chickenpox (Varicella)

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Case definition

- **Chickenpox** is an acute highly infectious disease, characterized by vesicular rash, mild fever and mild constitutional symptoms.

- **Herpes zoster** is a local manifestation of reactivation of latent varicella infection in the dorsal root ganglia.
- It occurs in 15% of normal immune adults.

Cycle of infection

- **Causative agent**

- **Chickenpox is caused by the varicella-zoster virus (VZV), also known as human herpes virus 3 (HHV-3), one of the eight herpes viruses known to affect humans.**

- **Reservoir**
- **Man in the form of cases.**
- **Source of infection**

Discharges of respiratory tract of infected persons and fluid of vesicles before they become dry

(scabs are not infective).

- **Exit**
- **Upper respiratory tract and lesions of the skin and mucosa.**

- **Mode of transmission**
- **Contact, direct, indirect and droplet.**
- **Air borne transmission by droplet nuclei.**
- **Trans placental: The virus can cross the placenta and may result in a condition known as congenital varicella.**

Portal of entry

- **Upper respiratory tract and skin.**

Incubation period

Two to three weeks

Period of communicability

A person with chickenpox is infectious one to two days before the rash appears . They remain contagious until all lesions have crusted over (this takes approximately six days).

Crusted lesions are not contagious.

Immunocompromised patients are **CONTAGIOUS** during the entire period as new lesions keepappearing.

Signs and symptoms

Fever

Headache

Sore Throat

Loss of Appetite

Fatigue

Rash Appears After 2-3 Days

In children the illness is not usually preceded by prodromal symptoms and the first sign is the rash.

The rash begins as small red dots on the face, scalp, torso and upper arms and legs; progressing over 10–12 hours to small bumps, blisters and pustules; followed by umbilication and the formation of scabs.

Diagnosis

The diagnosis of varicella is primarily clinical.

Confirmation of the diagnosis can be required through either examination of the fluid within the vesicles of the rash, or by testing blood for evidence of an acute immunologic response.

Epidemiology

- **Varicella affects nearly all children worldwide who do not have immunity.**

- **The maximum incidence of varicella in unvaccinated populations is in children aged 1-6 years.**
- **It is one of the classic diseases of childhood, with the highest prevalence in the 4–10 year old age group.**
- **Varicella is highly communicable, with an infection rate of 90% in close contacts.**

- **In temperate countries, most people become infected before adulthood but 10% of young adults remain susceptible.**

- **Maximum transmission occurs during late winter and spring.**

Susceptibility

Susceptibility to chickenpox is general among non-immune individuals.

Infection usually confers long lasting immunity

- **The viral infection may remain latent, and disease may return years later as herpes zoster in about 15% of older adults**

- **Infants born to immune mothers have passive immunity for the first 6 months of their life.**

Risk factors for severe varicella

Risk factors for severe varicella in neonates are as follows:

- **The first month of life: A neonate's first month of life is a susceptible period for severe varicella, especially if the mother is seronegative.**
- **Early delivery: Delivery before 28 weeks' gestation also renders a baby susceptible because trans placental transfer of immunoglobulin G (IgG) antibodies occurs after this time.**

Risk factors for severe varicella in adolescents and adults are as follows:

- ✓ **Steroid therapy: High doses (i.e., doses equivalent to 1-2 mg/kg/d of prednisolone) for 2 weeks or more are definite risk factors for severe disease. Even short-term therapy at these doses immediately preceding or during the incubation period of varicella can cause severe or fatal varicella**

- ✓**Malignancy:** **All children with cancer have an increased risk for severe varicella. The risk is highest for children with leukemia. Almost 30% of patients who are immunocompromised and who have leukemia have visceral dissemination of varicella; 7% may die.**

- ✓**Pregnancy:** **Pregnant women have high risk of severe varicella, especially pneumonia.**

- ✓ **Immunocompromised state (e.g., malignancy, anti malignancy drugs, human immunodeficiency virus [HIV], other congenital or acquired immunodeficient conditions): Defects of cellular but not humoral immunodeficiency are believed to render a person susceptible to severe varicella.**

Serious complications from chickenpox include:

- **Dehydration**
- **Pneumonia**
- **Bleeding problems**
- **Infection or inflammation of the brain (encephalitis, cerebellar ataxia)**

- **Bacterial infections of the skin and soft tissues in children including Group A streptococcal infections**
- **Blood stream infections (sepsis)**
- **Toxic shock syndrome**
- **Bone infections**
- **Joint infections**

Infection in pregnancy and neonates

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For pregnant women, antibodies produced as a result of immunization or previous infection are transferred via the placenta to the fetus.

Women who are immune to chicken pox can not become infectedand do not need to be worried about it for themselves or their infant during pregnancy.

Varicella infection in pregnant women could lead to viral transmission via the placenta and infection of the fetus.

If infection occurs during the first 28 weeks of gestation, this can lead to fetal varicella syndrome (also known as congenital varicella syndrome

Possible problems include:

- ✓ **Damage to brain: encephalitis microcephaly, hydrocephaly, aplasia of brain.**
- ✓ **Damage to the eye: microphthalmia, cataracts, optic atrophy.**

Other neurological disorder:

- ✓ **Damage to cervical and lumbosacral spinal cord, motor /sensory deficits, absent deep tendon reflexes**

Damage to body:

- Hypoplasia of upper/ lower extremities
- Anal and bladder sphincter dysfunction.

Infection late in gestation or immediately following birth is referred to as **neonatal varicella**

The risk of the baby developing the disease is greatest following exposure to infection in the period 7 days prior to delivery and up to 7 days following the birth.

Newborns who develop symptoms are at a high risk of pneumonia and other serious complications of the disease.

Prevention & Control

Prevention

1. Apply basic measures for prevention of respiratory diseases.
2. Immunization of young children (not available in Iraq).

Control Measures

- **For Cases**
- **Reporting to local health authority.**

- **Isolation: Exclude children from school for 1-2 weeks after rash first appear or until vesicles become dry.**

- **Disinfection: Concurrent and terminal disinfection of articles soiled by respiratory discharges.**

Treatment

There is no cure for chickenpox, and the virus usually clears up by itself without any treatment.

- **Fluids**
- **Antipyretics**
- **Antihistamines**
- **Antibiotics for 2^{o} infection**

Antiviral medicine

Acyclovir is an antiviral medicine that is sometimes given to people with chickenpox.

Acyclovir may be prescribed to:

- **pregnant women**
- **adults, if they visit their GP within 24 hours of the rash appearing**
- **newborn babies**
- **people with a weakened immune system (the body's defense system)**
- **healthy people older than 12 years of age**

- **people with chronic skin or lung disease**

- **For Contacts:**
  - **Put under observation for the maximum IP.**

  - **Varicella vaccine is effective in preventing illness or modifying varicella if used within 3 days after exposure.**

- **Varicella immune globulin given within 96 hours of exposure may prevent or modify disease in contacts.**

- **It is indicated for newborns of mothers who develop chickenpox within 5 days prior to or within 48 hours after delivery.**

Shingles (Herpes zoster)

Herpes zoster, also known as zoster and shingles, is caused by the reactivation of the varicella-zoster virus (VZV), the same virus that causes varicella (chickenpox).

Primary infection with VZV causes varicella. Once the illness resolves, the virus remains dormant (latent) in the dorsal root ganglia.

VZV can reactive later in a person's life and cause a painful, maculopapular rash called herpes zoster.

People with herpes zoster most commonly have a rash in one or two adjacent dermatomes (localized zoster). The rash most commonly appears on the trunk along a thoracic dermatome. The rash does not usually cross the body's midline.

The rash is usually painful, itchy or tingly. These symptoms may precede rash onset by days to weeks. Some people may also have headache, photophobia (sensitivity to bright light), and malaise in the prodromal phase.

The rash develops into clusters of clear vesicles. New vesicles continue to form over three to five days and progressively dry and crust over.
They usually heal in two to four weeks.
There may be permanent pigmentation changes and scarring on the skin.

The reasons why VZV reactivates and causes herpes zoster are not well understood.

Risk Factors

- ✓ **Only people who had natural infection with wild-type VZV or had varicella vaccination can develop herpes zoster.**
- ✓ **A person's risk for herpes zoster may increase as their VZV-specific cell-mediated immunity declines.**

This decline in immunity can result from increasing age and/or medical conditions and medications that suppress the immune system.

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- ✓ **A person's risk for herpes zoster increases sharply after 50 years of age.**

Complications

- ➢ **Post herpetic neuralgia (PHN) is the most common complication of herpes zoster.**

Other complications of herpes zoster include—

- ophthalmic involvement with acute or chronic ocular sequelae (herpes zoster ophthalmicus
- bacterial superinfection of the lesions, usually due to Staphylococcus aureus and, less commonly, due to group A beta hemolytic streptococcus
- cranial and peripheral nerve palsies
- visceral involvement, such as meningoencephalitis, pneumonitis, hepatitis, and acute retinal necrosis.