

Chickenpox

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Introduction

The varicella-zoster virus (VZV) causes two distinct clinical infectious diseases, chickenpox (varicella) and shingles (zoster).

Chickenpox is the primary infection caused by the varicella-zoster virus. It is an acute, highly infectious disease most commonly seen in children under 10 years old. Chickenpox is usually a mild, self-limiting illness and most healthy children recover with no complications. Adults tend to suffer more severe disease than children. In Ireland, the incidence of Chickenpox is seasonal reaching a peak from January to April when outbreaks of infection are common.

Anyone who has had chickenpox in the past may develop shingles. You can only get shingles if you have previously had chickenpox as it is a recurrence or reactivation of the varicella zoster virus.

It is not possible to develop shingles from exposure to a person with chickenpox. It is possible however, to develop chickenpox as a result of exposure to a person with shingles. Second attacks of chickenpox are rare but do occur.

Transmission

Chickenpox is highly contagious, infecting up to 90% of non-immune people who are exposed to the disease.

The **incubation period** (the time from becoming infected until symptoms appear) ranges from 10 to 21 days although is usually from 14-16 days. Susceptible individuals who have been in contact with a person with chickenpox should be considered potentially infectious from the 10th to the 21st day after exposure. The most infectious period is 1-2 days before the rash appears, but infectivity continues until all the vesicles have crusted over, at least 5 days after onset of the rash.

Chickenpox is transmitted by the following routes: -

- Airborne respiratory droplets.
- Direct contact with the vesicle fluid.
- Indirect contact through contact with clothes/linen freshly soiled by vesicle fluid
- Chickenpox can also be spread from people with shingles. A person with shingles can spread the VZV virus to others who have never had chickenpox. The exposed person would need to come in contact directly or indirectly with the vesicle fluid of the person with shingles but would develop chickenpox and not shingles.

Signs and Symptoms

Chickenpox may initially begin with cold-like symptoms, as the virus is shed from the naso-pharynx for up to 5 days before the rash appears. This may be accompanied by fever, mild headache and myalgia.

An intensely itchy, vesicular (fluid-filled blister-like) rash appears - these crops of vesicular spots appear, mostly over the trunk and to a lesser extent the limbs. The severity of infection varies and it is possible to be infected but show no symptoms. Infectivity may be prolonged in people with altered immunity.

Complications

- The risk of complications varies with age and is higher in infants under 1 and in persons over 15 years.
- Nearly all children recover completely and have detectable antibodies for many years. Complications in childhood are uncommon but may occur and include neurological complications (meningitis, encephalitis) and more rare glomerulonephritis and myocarditis.
- In children under 5, skin bacterial super infection is the most common complication. This manifests as a sudden high grade temperature (often after initial improvement), erythema and tenderness surrounding the original chickenpox lesions.
- Adults with chickenpox may develop more severe disease with lung involvement of varying severity, with smokers at higher risk of fulminating varicella pneumonia.
- Maternal infection in pregnancy carries a greater risk of severe varicella pneumonia in the mother, especially late in the second trimester and early in the third trimester. Risks to the foetus and neonate are related to the time of infection in the mother.
 - Varicella infection in the first 20 weeks of pregnancy can cause a variety of abnormalities in the foetus; low birth weight, underdevelopment of a limb(s), skin scarring, poor development of localised muscles or brain abnormality. The mortality rate ranges from 1-2%.
 - Varicella infection around the time of delivery from 5 days before to 2 days after delivery may result in overwhelming infection in the infant and a fatality rate as high as 30%. This severe disease is believed to result from fetal exposure to varicella virus without the benefit of passive maternal antibody.

Diagnosis

Chickenpox may be diagnosed by clinical signs and symptoms. The diagnostic feature of chickenpox is the vesicular rash which starts as small papules, develop into clear vesicles which become pustules and then dry into crusts. The rash usually appears first on the trunk and successive crops of vesicles appear over several days although hands and feet are relatively spared.

Laboratory confirmation is rarely required but if necessary, is available by sending a microscopy slide with vesicle fluid to the National Reference Laboratory. Serology is also available and is used to demonstrate immunity.

Treatment

There is no specific treatment for chickenpox. It is a viral infection that will therefore not respond to antibiotics. Treatment should be based on reducing symptoms such as fever and itchiness (See "Chickenpox-Information Leaflet").

People at higher risk of developing serious complications from chickenpox may be given antiviral drugs such as acyclovir and/or immunoglobulin (a specialised preparation of antibodies taken from the plasma of blood donors), which may prevent severe illness developing.

These people include pregnant women who are not immune, neonates, immunosuppressed people e.g. receiving chemotherapy or radiotherapy, received an organ transplant and are receiving immunosuppressant therapy etc. (Refer to Immunisation Guidelines for Ireland, 2008- Chapter 17 Varicella-Zoster updated September 2011 available on the National Immunisation Office website www.immunisation.ie).

Infection Prevention and Control Precautions for Residents with Chickenpox

- All staff caring for a resident/client with suspected chickenpox should have a previous history of chickenpox or have evidence of immunity. The Occupational Health Department holds vaccination and immunity details on staff who have attended for pre-employment assessment. (Please make contact with the Occupational health Department if you have a query in relation to your immunity).

Only immune staff should care for these residents/clients.

Airborne and Contact Precautions should be used for all residents in a healthcare facility during the infectious period until the vesicles have crusted over.

- Inform the Infection Prevention and Control Nurse that you have a resident/client with a possible/confirmed diagnosis of chickenpox and seek advice.
- All residents/clients with a possible/confirmed diagnosis of chickenpox should be placed in a single room or segregated from other non-immune clients until all vesicles are dry and have crusted over. This is advised because of the risk of varicella in susceptible immuno-compromised residents/clients.
- **Masks** are not completely effective in preventing transmission, so susceptible persons (staff and visitors) should avoid contact with residents/clients with chickenpox.
- Please refer to Airborne and Contact Precautions in Transmission-Based Precautions in Section 6 for further detail.

Additional Considerations - Identify all exposed contacts

Contacts

A Chickenpox 'Contact' is defined as any resident/client or staff member who is non-immune to the varicella-zoster virus and who has had contact with a case of chickenpox at anytime from 48 hours before the onset of the rash until all the vesicles are crusted and there is no further cropping.

This will include:

- Household contacts
- Contacts in the same room for a significant period usually 1 hour or more (e.g. classroom or a 2-4 bedded hospital room).
- Direct face to face contacts such as when having a conversation (usually 5 minutes or more)

Management of Staff Contacts

- Staff contacts that are not immune to chickenpox must be identified because they may be affected themselves or may transmit the disease to vulnerable residents/clients while incubating the disease themselves.
- The ward/department manager needs to report all cases of chickenpox to the Occupational Health Department so that contact screening can commence. The Occupational Health Department will establish if there are any possible staff contacts that may require vaccination or Varicella Zoster Virus Immunoglobulin (VZVIG).
- Non-immune staff must report immediately to Occupational Health and be offered vaccination to protect themselves and patients. (Refer to Immunisation Guidelines for Ireland, 2008)

Potentially High Risk People include: -

Those at higher risk for severe disease and complications include:

- Pregnant women
- Infants under 1 month old
- Immunocompromised individuals including those with haematological malignancies, on chemotherapy, high dose steroids or with HIV infection.

Management of high risk resident/client contacts

- If a resident/client is immuno-compromised and has a significant exposure to VZV then the decision regarding where the resident/client should be nursed will be made in consultation with the clinician responsible for their care.
- The medical officer/team/GP should discuss the case with a Medical Microbiologist or Consultant in Public Health Medicine as appropriate. If Human Varicella-Zoster Immunoglobulin (VZIG) is indicated, the optimum time for administration is within 96 hours of exposure. (Refer to Immunisation Guidelines for Ireland, 2008)

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