Varicella and Herpes Zoster Guidance

Reference: 1065
Written by: Fiona Shackley
Peer reviewer: Sarah Thompson
Approved: February 2019
Review Due: March 2022

Purpose
To provide guidance to clinical staff at Sheffield Children’s Hospital on the management of patients with infection with, and reactivation of, varicella zoster virus (VZV).

Intended Audience
This guideline is primarily intended for use by medical staff and advanced nurse practitioners who are reviewing and formulating management plans for patients with VZV.
Table of Contents
1. Purpose
2. Introduction
3. Intended Audience
4. Guideline Content
   A. Who to treat with Aciclovir
   B. Severe disease and toxic shock
   C. Infection control & isolation
   D. Management of at risk contacts
      1. Who should get VZIG
      2. Active disease
   E. Varicella Vaccine
   F. Children with shingles
5. References

1. Purpose

To provide guidance to clinical staff at Sheffield Children’s Hospital on the management of patients with infection with, and reactivation of, varicella zoster virus (VZV).

2. Introduction

Primary varicella zoster virus (VZV) infection, commonly known as chicken pox, is transmitted from the index case by respiratory secretions or contact with active skin lesions. Herpes zoster, or shingles, is caused by a local reactivation of dormant VZV. It is less infectious as transmission can only occur from contact with skin lesions unless the child is immunocompromised.

VZV can be fatal in the immunocompromised, and young infants. It can also be fatal in otherwise healthy children particularly if associated with a secondary bacterial infection, usually caused Group A Streptococcus or Staphylococcus aureus. Severe secondary bacterial infection may be exacerbated by use of non-steroidal anti-inflammatory drugs (NSAID see below) which should not be routinely prescribed in acute VZV infection.

Any child with recent chicken pox who presents with a recurrence of fever, or whose fever does not settle during the initial days of skin lesions should be managed aggressively with antibiotics (+/- IVIG) as well as antivirals and monitored closely for evidence of septic shock.

Shingles is not uncommon in children and while consideration should be given to look for evidence of immunosuppression, this is not the case in most children.
Prevention of primary infection is important in immunocompromised individuals and they merit assessment for prophylaxis with VZIG or acyclovir following a confirmed significant exposure.

3. Intended Audience

This guideline is primarily intended for use by medical staff and advanced nurse practitioners who are reviewing and formulating management plans for patients with VZV.

4. Guideline Content

A. WHO TO TREAT WITH ACICLOVIR

Most patients with primary VZV infection (chicken pox) do not require antiviral treatment as the risk of severe disease is low. Children at higher risk of severe disease require treatment with aciclovir. Indications for treatment with intravenous or enteral aciclovir are listed below.

Refer to the BNFC for guidance on aciclovir dosing.

IV aciclovir:

- Any child with primary immune deficiency
- Children on immunosuppressive medication
- Children on replacement steroids
- Neonates under 4 weeks of age
- Children with severe VZV or complications such as pneumonitis or encephalitis

Duration of IV aciclovir depends upon the degree of immunosuppression and/or severity of illness.

Enteral aciclovir:

Consider enteral aciclovir for children in the following risk groups:

- Children with chronic skin conditions (e.g. eczema)
- Children with other chronic health problems that might be exacerbated by VZV infection including cystic fibrosis, diabetes, chronic chest conditions and salicylate treatment.
- Otherwise well teenagers >13 yrs
- Prophylaxis in at risk individuals if VZIG not indicated/possible (see below)
B. SEVERE DISEASE AND TOXIC SHOCK

The majority of deaths from chicken pox are due to secondary bacterial infection. Chicken pox is a risk factor for the subsequent development of severe invasive Group A Streptococcus or Staphylococcus aureus infection. Secondary bacterial infections may occur while new skin lesions are still cropping or up to 3-4 weeks after the initial infections. This can result in septicaemia, toxic shock and/or deep soft tissue, bone or lung infections.

If a child’s fever is not settling, the rash looks infected or they are systemically unwell, the following samples should be obtained:

- Blood culture
- Skin swab – for culture and sensitivity
- Skin swab – for VZV PCR

Intravenous antibiotics should be commenced as below. Refer to the SCH antibiotic guideline for dosing information:

- Benzylpenicillin
- Flucloxacillin
- Add clindamycin if the child is septic or showing signs of toxic shock.
- (Broader spectrum cover may be necessary initially if the diagnosis is in doubt. In these situations substitute the benzylpenicillin for cefotaxime).

Consider IVIG (2g/kg) in a septic child. Refer to the immunoglobulin guidelines and discuss these patients with the Infectious Diseases Team or a microbiologist. There is no role for varicella immunoglobulin (VZIG) in the treatment of active VZV infection.

Some children may develop multisystem disease including hepatitis, pneumonitis, cardiomyopathy or encephalitis or cerebellitis. These may reflect secondary bacterial sepsis or an unusual host response to VZV. Encephalitis can occur acutely within the first few days with seizures and meningeal signs. Cerebellitis may present later and have a slower onset. Both conditions are felt to be driven by immune mediated or vasculitic phenomena but treatment with aciclovir is often still recommended.

Eye Disease

Lesions in the eye are common with primary chicken pox. If mild then symptomatic care alone or topical acyclovir may be required, more severe cases should be discussed with an ophthalmologist.
NSAID and VZV
There are concerns that the use of NSAIDs in children with varicella is associated with an increased risk of necrotizing soft-tissue infections and infections with invasive group A streptococci. Paracetamol should be used in preference to NSAIDs in patients with chicken pox.

C. INFECTION PREVENTION AND CONTROL

VZV is extremely infectious, particularly in the early stages of the primary infection. Spread occurs through transmission of virus in respiratory secretions or by direct contact with active lesions.

Patients are infectious from two days before the presence of a rash and until new lesions have stopped appearing and remaining lesions are all crusted over. Patients with chicken pox should be isolated in a single room with strict barrier precautions whilst they are infectious. As people with chickenpox are infectious prior to appearance of spots, those who have had contact with chicken pox in the last 21 days (and who have not themselves previously had the infection) require isolation. Please refer to the SCH Infection Prevention and Control guidelines for further information.

D MANAGEMENT OF AT RISK CONTACTS

1. FOLLOWING REPORTED EXPOSURE

Detailed information about management of contacts and indications for VZIG including criteria to consider an at risk exposure are available from the ‘Green Book’ (Immunisation Against Infectious Disease, freely available online) on the PHE website or from discuss with the Virology Team at NGH (Ext 66477 during normal working hours. Via STH Switchboard out of hours)

A significant exposure is classed as any face-to-face contact; being in the same room as someone with active chickenpox for 15 minutes or longer; or household member. If exposure occurs in an at risk patient severe chicken pox can be prevented by administration of Varicella Zoster immunoglobulin (VZIG) or oral aciclovir. Neither of these options will necessarily stop infection completely and children should be monitored for symptoms and treated with IV aciclovir if lesions develop. VZIG may also delay the onset of symptoms. Guidelines for the use of acyclovir as post exposure prophylaxis are available in the Haematology and Oncology Unit guidelines (?) The duration of aciclovir treatment recommended in the trust is for three weeks after exposure rather than the BNFc recommendation of 7 days post-exposure.
VZIG can be obtained from the Virology Department at NGH. There is always an on call consultant available if advice or access to VZIG is required out of hours. VZIG will usually only be dispensed if the child is known to be antibody negative and the child is within the time frame for post exposure prophylaxis to be of benefit.

WHEN_TO_GET_VZIG

Individuals at risk of severe VZV with no evidence of VZV antibodies

Risk period for exposure to the index case is 48 hours before rash develops till lesions have crusted over (approximately 5 days). VZIG may be of benefit up to 10 days after exposure but should ideally be given within 7 days.

VZV antibodies should be checked where possible in all children felt to be at risk of severe VZV. An urgent blood test should be arranged for children whose status has not been documented. Results should be available the same day if the urgency is highlighted to the virology laboratory.

Risk groups include:
1. Children with primary immune deficiency (unless already on immunoglobulin replacement)
2. Children on immunosuppression who have no evidence of VZV antibodies: this includes steroids (2mg/kg for 1 week or 1mg/kg for 1 month) and other immunosuppressive agents. Risk of severe VZV can extend for 3 months following stopping high dose steroids. If in doubt discuss with the Infectious Diseases or Virology teams
3. Children during, and for 6 months following, chemotherapy
4. Babies born to mothers who develop VZV infection in the 7 days before to 7 days after delivery
5. VZV antibody negative infants (ie if mum VZV antibody negative) exposed to VZV at <7 days of age
6. Preterm infants born before 28 weeks gestations irrespective of maternal VZV antibody status if they are still requiring hospitalisation
7. Children on mild immunosuppression may not need VZV antibodies rechecked if previous antibody results were >150 or if they have had 2 doses of varicella vaccine. Children on significant immunosuppression may lose protective antibody. Please discuss with Virology and if in doubt recheck levels.
8. Children on immunoglobulin replacement or aciclovir, valaciclovir or valganciclovir prophylaxis may not need VZIG but the dose of antiviral may need increasing.

Clear flow diagrams are available in DOH Green book and PHE Varicella immunoglobulin guidelines (link) indicating indications for immunoglobulin and when blood samples for VZV antibody are indicated prior to administering VZIG.
VZIG is given by IM injection in anterolateral thigh or outer upper buttock

DOSE:  
0-5yrs : 250mg (1 vial)  
6-10yrs : 500mg  
11-14yrs : 750mg  
>15yrs : 1000mg

**AT RISK CHILDREN WITH ACTIVE INFECTION or POSSIBLE INFECTION**

Children on high dose systemic immunosuppression who develop acute chicken pox or possible chicken pox should be seen and assessed in secondary care. Most children should be offered IV aciclovir if the clinical diagnosis is made. Sometimes it is unclear whether the diagnosis is VZV, please consider testing for HSV and enterovirus (skin swab of a lesion using a green viral swab). Remember children with chickenpox will present with fever prior to skin lesions appearing and chicken pox should be on the differential for a febrile illness in an immunocompromised child who has missed prophylaxis following a significant exposure. Immunocompromised children may develop severe disease with minimal or atypical skin rash. Samples from throat, skin lesions and blood (PCR not serology) may help confirm the diagnosis but commence treatment pending results. While the impact of antiTNF therapy on severe varicella is unclear IV aciclovir should be considered but treatment with oral aciclovir may be adequate in this group with clear recommendations to be reassessed if there is clinical deterioration.

**D. VARICELLA VACCINE**

This is a live attenuated vaccine that is not routinely offered to children in the UK. **It should not be given to immunocompromised children or children on immunosuppression or long term steroids, as it is a live vaccine.** It should be offered to susceptible non immunocompromised family members, e.g. parents and siblings, of an immunocompromised child.

Vaccine can also be offered to other specific risk groups where the risk from infections is greater than any risk from the vaccine e.g.

- HIV infected children with CD4 count >250
- VZV antibody negative children who may need immunosuppression in the future but where treatment can be delayed for a month for live vaccine to be given
- In the non-immunocompromised given within 3 days of exposure, varicella vaccine may modify the course of infection and may be recommended in out break situations in schools and nurseries.

Varicella vaccine can also be offered through occupational health to non-immune healthcare workers.
E. CHILDREN with SHINGLES

Otherwise normal children may develop shingles. This can often occur if their initial VZV infection occurred at <6-12 months of age and was attenuated by passive maternal antibody. Occasionally this may be an indication that the child is immunosuppressed and this needs to be considered when assessing the child. Oral aciclovir can reduce pain and duration of symptoms. It works best if started within 72hrs of onset of rash in index case. Children with immunodeficiency may need intravenous aciclovir depending upon severity of illness.

5. References

PHE varicella immunoglobulin guidelines
BNFc 2017
RCPCH Blue book
BMJ Best Practice 2016