Chickenpox in Pregnancy

University Hospitals of Leicester NHS Trust

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Contents

1. Introduction and Who Guideline applies to

This guideline is intended for the use by all UHL staff involved in the care of pregnant people who have been exposed to or have acquired chickenpox.

Background:

Chickenpox (varicella) infection is caused by the varicella zoster virus (VZV). This is a common childhood disease with over 90% of those aged 15 year and above immune to VZV. The virus can remain dormant in sensory nerve root ganglia and can then be reactivated to cause a vesicular erythematous skin rash in a dermatomal distribution known as herpes zoster (shingles).
This virus is highly contagious and is transmitted by respiratory droplets and aerosols, and direct personal contact. The incubation period is between 1-3 weeks. The infectious period begins before onset of rash and may continue until all lesions have crusted over. Shingles infection is primarily transmitted by direct contact with vesicle fluid and is considered infectious from onset of rash until all of the lesions have crusted over.
Both chickenpox and shingles pose a risk to susceptible pregnant persons.

The majority of pregnant people are immune to varicella and infection with VZV is uncommon in pregnancy. It is estimated that VZV infection complicates about 3 in 1000 pregnancies. Varicella infection in pregnancy can lead to maternal mortality or serious

morbidity. About 10-20% of infected pregnant people develop varicella pneumonitis which can lead to severe sepsis, disseminated intravascular coagulopathy, acute respiratory failure and death.
Maternal VZV infection in the first 20 weeks of pregnancy lead to fetal varicella syndrome (FVS). FVS is a multi-system disorder of the fetus with skin lesions, neurological and cardiovascular abnormalities, limb and muscle hypoplasia, mental retardation as well as abnormalities of the genitourinary and gastrointestinal systems.
The risk of embryopathy with maternal varicella infection is highest between 13-20 weeks gestation and is estimated to be around 2%. The risk of embryopathy before 13 weeks gestation is around 0.4%.
Maternal VZV infection in the third trimester can lead to severe neonatal varicella in the first week of life.

Post-exposure Prophylaxis (PEP) is offered to pregnant people if they fulfil PEP criteria of 'significant exposure' and 'no antibodies to VZV', to attenuate maternal disease and reduce complications such as pneumonitis and, for infections in late pregnancy, to achieve theoretical reduction in severity of neonatal disease.

2. Guideline Standards and Procedures

2.1 Risk assessment of pregnant people following exposure to varicella or shingles

History	Testing	Treatment
A past history of chickenpox/ shingles OR 2 recorded doses of varicella vaccine.	Do not test.	Assume immune. No need for PEP.
Uncertain or no history of chickenpox/ shingles AND Unknown or negative varicella vaccine history	Test antenatal booking bloods* (if available) for VZV IgG. *This can be arranged by phoning the virology lab in working hours*	If VZV IgG quantitative assay is ≥100 mIU/ml – reassure, PEP is not indicated. If the result from quantitative testing will not be available within 10 days of exposure, then treat with antivirals.

*For people with an uncertain or negative history of chickenpox, antenatal booking bloods should be tested unless there is a recorded chickenpox exposure in this pregnancy, in which case a fresh sample should be taken for testing if the booking sample is negative.

2.2 Definition of significant exposure to VZV

Three aspects of exposure to VZV during the infectious period are relevant when considering the need for PEP:

A. Closeness and duration of contact- in addition to household contacts, PEP should be offered in the following circumstances:
   - Any face-to-face contact, for example having a conversation
   - 15 minutes or more in a small room (in the home, classroom, hospital bay)
   - Where the infectious person is immunosuppressed, contact in larger areas (e.g. hospital ward) may also require PEP to be offered as immunosuppressed individuals may have higher viral shedding

B. Timing of exposure - PEP should be offered to pregnant people;

   - Where there is continuous exposure to chickenpox or shingles (e.g. household member, nursery or care worker)
   - Where there has been more than one exposure (e.g. infected friend visited more than once during infectious period)
   - Where there has been a single exposure to a case of chickenpox from 24-48 hours before onset of rash until 5 days after rash appearance in an immunocompetent individual, and until all lesions have crusted over in an immunocompromised individual
   - Where there has been a single exposure to a case of shingles from rash appearance until all lesions have crusted over

C. Type of VZV infection in index case- PEP should only be offered following contact with individuals with chickenpox, with disseminated shingles, exposed shingles (not covered by clothing, for example ophthalmic) or with immunosuppressed individuals with any kind of shingles.

Non-immune pregnant people who have been exposed to chickenpox should be managed as potentially infectious from 8–28 days after exposure if they receive VZIG and from 8–21 days after exposure if they do not receive VZIG.

2.3 Post Exposure Prophylaxis

Without PEP, risk of developing chickenpox following significant exposure is high (>70%).

A. Antivirals (Aciclovir or Valaciclovir)

In light of the existing evidence on the safety of aciclovir, the efficacy of aciclovir in preventing clinical chickenpox in healthy and immunosuppressed contacts and the relative sub-optimal efficacy of VZIG as PEP in pregnant people, antivirals are now the treatment of choice for exposure to varicella and shingles for susceptible people exposed in any stage of pregnancy. (UKHSA 2022)

Although oral aciclovir and valaciclovir are not licensed in pregnancy, there is extensive evidence of safety, including from 2 large registries of infants whose mothers were exposed to aciclovir in pregnancy. From follow up across 24 countries between 1984 to 1999 of over

1,200 pregnancies that received either oral or IV aciclovir across all stages of pregnancy, no unusual defects or patterns of defects were observed. In a Danish national cohort study of 1,804 exposures to antiviral agents (aciclovir, valaciclovir, famciclovir) in pregnancy, no increase in major birth defects was reported in people exposed to either aciclovir or valaciclovir in the first trimester.
As for any prescribing of medications not licensed for use in pregnancy, this should be discussed with the pregnant person and documented in their health record.

Any susceptible pregnant people who, after risk assessment, is deemed to require PEP should be advised to take antivirals from day 7 to day 14 after exposure. The day of exposure is defined as the date of onset of rash in a household contact, or the date of first or only contact in multiple or single exposures respectively. If the person presents between days 7 and 14 of exposure, a 7-day course of antivirals can be started.
Aciclovir (800 mg 4 times a day for 7 days) is recommended. Oral valaciclovir 1000 mg 3 times a day can be used as a suitable second line alternative. Varicella-Zoster Immunoglobulin (VZIG should) only be offered if the pregnant person is unable to take oral antivirals due to malabsorption or renal toxicity.
The dose of aciclovir may need to be adjusted in people with renal impairment. Individuals with glomerular filtration rates less than 10 mL/minute/1.73m^2 may need the frequency or dose altered (please see BNF).
In individuals with severe renal impairment or intestinal malabsorption, for example inflammatory bowel disease, VZIG may need to be considered, and these people should be discussed with the Maternal Medicine team.

The most commonly reported side effects from aciclovir include dizziness, headache, nausea, vomiting, diarrhoea, abdominal pain, skin rashes, photosensitivity, pruritus, urticaria and fatigue. Further information about side effects on aciclovir and valaciclovir are available in the BNF.

B. Human varicella-zoster immunoglobulin (VZIG)

For individuals who are unable to take oral antivirals, VZIG should be given. VZIG is prepared by Bio Products Limited (BPL) from the pooled plasma from non-UK blood donors and is dispensed in vials of 250 mg (minimum 100 IU/ml). As with any other blood product, although screened for HIV, Hepatitis B and C, there remains a very low risk of transfusion transmitted infections.
VZIG is issued by the Rabies and Immunoglobulin Service Security Agency, Colindale (tel: 0330 128 1020) (request form available to download at www.gov.uk/government/publications/post-exposure-prophylaxis-for-chickenpox-and-shingles) and some local UK HSA laboratories, following a risk assessment of the exposed individual.
In individuals 15 years or older, the dose of VZIG for PEP is 1000 mg *im*, given into a large muscle.
VZIG should ideally be administered within 10 days (preferably 7 days for immuno-suppressed contacts) of the day of exposure. The day of exposure is defined as the date of the onset of the rash if the index case is a household contact, or date of first or only contact if the exposure is on multiple or single occasion(s).
VZIG is not indicated after rash has developed.

IVIG (intravenous immunoglobulin) may need to be administered to some people in place of VZIG, for example people who are already on IVIG for immunodeficiencies or people for whom VZIG is required but an IM injection is contraindicated due to bleeding disorders.

2.4 .Subsequent exposure to chickenpox or shingles during the same pregnancy

Pregnant people who have a second exposure during pregnancy should be risk assessed and may need to have a repeat VZV antibody test, given the rates of seroconversion with both VZIG and aciclovir. If presenting late after the exposure, there may not be sufficient time to perform VZV IgG testing within the 10-day window. Discussion with virology advised in these instances.
Given the short half-life of aciclovir or valaciclovir, if there is a second exposure immediately after a course of antivirals, a second risk assessment and course should be given in the same way starting 7 days after the subsequent exposure.

Individuals who have previously received VZIG or IVIG as PEP require a new risk assessment if a second exposure occurs:
-within 3 weeks of administration of VZIG or IVIG, further PEP is not required
-between 3 and 6 weeks following administration of VZIG or IVIG, further PEP (dose of VZIG) should be administered without further testing
-more than 6 weeks following administration of VZIG or IVIG, retesting of a new sample is required

3. Management of pregnant people who develop chicken pox in pregnancy

- Pregnant persons presenting with a chickenpox rash should be started on a therapeutic dose (aciclovir 800 mg 5 times a day or 1,000mg valaciclovir 3 times a day for 7 days, starting from the day of onset of the rash).
- Those who are thought to have signs and symptoms of severe chickenpox should have a hospital assessment. Pregnant persons who smoke cigarettes, have chronic lung disease, are immunosuppressed or are in the second half of pregnancy should also be considered for hospital assessment.
- If severe chickenpox develops, the pregnant person should be hospitalised and treated with IV aciclovir.
- They should be isolated from other pregnant persons, babies and non-immune staff when attending for medical assessment
- They should be advised to avoid contact with other susceptible individuals (other pregnant persons and neonates) until lesions have crusted over, which is typically five (5) days after the onset of rash.
- Pregnant persons with chickenpox should be advised regarding hygiene measures to avoid superimposed bacterial infections.
- VZIG has no therapeutic benefit once chickenpox has developed and should therefore not be administered to pregnant persons who have developed a chickenpox rash.

3.1 Risks

- Pregnant people should be counselled about the risks of chickenpox to themselves and their baby
- They should be advised about the signs and symptoms of chickenpox which include pruritic rash, crops of vesicles, fever and malaise.
- Chickenpox can have potentially life-threatening complications like pneumonitis, hepatitis, encephalitis, maternal death, fetal varicella syndrome and varicella infection of newborn.

- Pregnant people should be advised that there is no apparent increase in miscarriage if chickenpox occurs during first trimester.
- If a pregnant person develops chickenpox in the first 28 weeks of pregnancy, their fetus will have a small risk of developing fetal varicella syndrome and this should be discussed with them.
- All pregnant people who develop chickenpox in pregnancy should be referred to a fetal medicine specialist at 16-20 weeks gestation or 5 weeks after infection if outside this range, for detailed ultrasound examination of the fetus and discussion.
- Pregnant people who develop chickenpox during pregnancy should be counselled about risks and benefits of amniocentesis to detect varicella DNA in amniotic fluid; however amniocentesis should only be performed once the skin lesions have completely healed.

3.2 Delivery

- Delivery should to be considered on an individual basis
- Delivery while the vesicles are still active maybe hazardous and poses a very high risk of maternal morbidity and mortality and therefore should be avoided. There is also a high risk of varicella infection of the newborn with significant morbidity and mortality.
- Ideally, a minimum of 7 days should elapse between onset of rash and delivery providing continuing the pregnancy does not pose any additional risk to mother or baby.
- The newborn is at high risk of varicella infection which has significant morbidity and mortality. The risk of acquiring this is highest if maternal infection occurs in the last 4 weeks of a person's pregnancy.
- Pregnant people with chickenpox requiring delivery should be reviewed by the anaesthetist. There's no evidence to inform decisions on the optimum method of anaesthesia. General anaesthesia may exacerbate respiratory compromise and theoretically there is risk with spinal anaesthesia transmitting the virus to the CNS. A site free of cutaneous lesions should be chosen for needle placement.
- A neonatologist should be informed of the birth of babies to people who developed chickenpox at any gestation during pregnancy.
- People who had chickenpox can breastfeed unless otherwise contraindicated. If there are active lesions close to the nipple they should express milk from the affected breast until the lesions crust over. The expressed milk can be used if baby has received treatment with aciclovir or VZIG.

3.3 Pregnant people who are found to be VZV IgG negative

- Pregnant people who are found to be VZV IgG negative should consider varicella vaccination postpartum.
- If vaccination administered to a non-pregnant person, they should avoid getting pregnant for 4 weeks after completion of the course of vaccine and also avoid contact with other pregnant people and neonates if a rash occurs.
- If the vaccine is administered postpartum, they can be reassured that it is safe to breastfeed.

4. Education and Training

None

5. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
People with significant, exposure should be treated appropriately	Review of case notes	Named Consultant	As occurs	Perinatal Review Group

6. Supporting References

1. Chicken Pox in Pregnancy Greentop Guideline RCOG 2015
2. Guidelines on post exposure prophylaxis (PEP) for varicella/shingles (April 2022) UK Health security Agency
3. Management of chickenpox exposure in Paediatrics UHL guideline

7. Key Words

Chickenpox in pregnancy, shingles, varicella, post exposure prophylaxix, antivirals, VZIG

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

DEVELOPMENT AND APPROVAL RECORD FOR THIS DOCUMENT		
Author / Lead Officer:	N Archer, B Trivedi, S Agarwal and N Clark	**Job Title:** Obstetricians and Midwife
Reviewed by:	C Webster	
Approved by:	Guidelines and Maternity Service Governance Meeting	**Date Approved:**

REVIEW RECORD			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
April 2017	V1	N Archer and H Ulyett	No need to ring Collingdale, can ring LRI so flow chart amended
May 2020	V2	Dr Rakhee Saxena and N Archer	Flow chart amended to include updated contact details.updated from NUH to UHL. General Update.

January 2022	V3	C Webster	Updated actions following significant exposure and unsure of previous infection. Non-immune and has had significant exposure before 20+0 weeks' gestation, she should be given VZIG. 20+/40 either VZIG or oral Aciclovir (800mg 4 times a day from days 7 to 14 after exposure). Valaciclovir 1000mg 3 times a day can be used as a suitable alternative. Women who have a second exposure during pregnancy, should be risk assessed given the high rates of seroconversion VZIG is no longer stored at UHL
May 2022		Maternity Governance Committee	Approved to allow VZIG request process to be up to date and available for staff to follow whilst HSA recommendations for PEP are under review.
August 2022		A Akkad – Consultant Maternity guidelines	Oral aciclovir or valaciclovir now first line treatment unless contraindicated

Appendix 1: Process for pregnant people booked at the University Hospitals of Leicester NHS Trust who are exposed to Varicella (Chickenpox/Shingles) infection in pregnancy