

Chickenpox exposure in pregnancy

Chickenpox is caused by primary infection with varicella zoster virus. Shingles is reactivation of dormant virus in dorsal root ganglion. In pregnancy there is a risk to both the mother and also the fetus, a syndrome now termed fetal varicella syndrome

Fetal varicella syndrome (FVS)

- risk of FVS following maternal varicella exposure is around 1% if occurs before 20 weeks gestation
- studies have shown a very small number of cases occurring between 20-28 weeks gestation and none following 28 weeks
- features of FVS include skin scarring, eye defects (microphthalmia), limb hypoplasia, microcephaly and learning disabilities

Management of chickenpox exposure

- if there is any doubt about the mother previously having chickenpox maternal blood should be checked for varicella antibodies
- if the pregnant woman is not immune to varicella she should be given varicella zoster immunoglobulin (VZIG) as soon as possible. RCOG and Greenbook guidelines suggest VZIG is effective up to 10 days post exposure
- consensus guidelines suggest oral aciclovir should be given if pregnant women with chickenpox present within 24 hours of onset of the rash

Chlamydia

Chlamydia is the most prevalent sexually transmitted infection in the UK and is caused by *Chlamydia trachomatis*, an obligate intracellular pathogen. Approximately 1 in 10 young women in the UK have *Chlamydia*. The incubation period is around 7-21 days, although it should be remembered a large percentage of cases are asymptomatic

Features

- asymptomatic in around 70% of women and 50% of men
- women: cervicitis (discharge, bleeding), dysuria
- men: urethral discharge, dysuria

Potential complications

- epididymitis
- pelvic inflammatory disease
- endometritis
- increased incidence of ectopic pregnancies
- infertility

- reactive arthritis
- perihepatitis (Fitz-Hugh-Curtis syndrome)

Investigation

- traditional cell culture is no longer widely used
- nuclear acid amplification tests (NAATs) are now rapidly emerging as the investigation of choice
- urine (first void urine sample), vulvovaginal swab or cervical swab may be tested using the NAAT technique

Screening

- in England the National *Chlamydia* Screening Programme is open to all men and women aged 15-24 years
- the 2009 SIGN guidelines support this approach, suggesting screening all sexually active patients aged 15-24 years
- relies heavily on opportunistic testing

Management

- doxycycline (7 day course) or azithromycin (single dose). The 2009 SIGN guidelines suggest azithromycin should be used first-line due to potentially poor compliance with a 7 day course of doxycycline
- if pregnant then erythromycin or amoxicillin may be used. The SIGN guidelines suggest considering azithromycin 'following discussion of the balance of benefits and risks with the patient'
- patients diagnosed with *Chlamydia* should be offered a choice of provider for initial partner notification - either trained practice nurses with support from GUM, or referral to GUM
- for men with symptomatic infection all partners from the four weeks prior to the onset of symptoms should be contacted
- for women and asymptomatic men all partners from the last six months or the most recent sexual partner should be contacted
- contacts of confirmed *Chlamydia* cases should be offered treatment prior to the results of their investigations being known (treat then test)

Human papilloma virus vaccination

Human papilloma virus (HPV) is the main aetiological factor in the development of cervical cancer. A vaccination programme has therefore been introduced for girls aged 12-13 years. A number of catch-up programmes are being introduced for older girls.

The Department of Health has chosen the Cervarix which offers protection against HPV type 16 & 18. An alternative vaccine is available called Gardasil. As well as protecting against HPV 16 & 18 it also protects against HPV 6 & 11. This has the advantage of also giving some protection against genital warts

For the vaccine to be effective it should be given before sexual activity starts. Cervarix is given in 3 stages with the second dose given 1 month and the third dose 6 months after the first dose

Injection site reactions are particularly common with HPV vaccines

Influenza vaccination

Seasonal influenza still accounts for a significant morbidity and mortality in the UK each winter, with the influenza season typically starting in the middle of November. This may vary year from year so it is recommended that vaccination occurs between September and early November. There are three types of influenza virus; A, B and C. Types A and B account for the majority of clinical disease. Current vaccines are trivalent and consist of two subtypes of influenza A and one subtype of influenza B.

The Department of Health recommends annual influenza vaccination for people older than 65 years and those older than 6 months if they have:

- chronic respiratory disease (including asthmatics who use inhaled steroids)
- chronic heart disease (heart failure, ischaemic heart disease, including hypertension if associated with cardiac complications)
- chronic kidney disease
- chronic neurological disease: (e.g. Stroke/TIAs)
- diabetes mellitus (including diet controlled)
- immunosuppression due to disease or treatment (e.g. HIV)
- asplenia or splenic dysfunction
- pregnant women

Other at risk individuals include:

- health and social care staff directly involved in patient care (e.g. NHS staff)
- those living in long-stay residential care homes
- carers of the elderly or disabled person whose welfare may be at risk if the carer becomes ill (at the GP's discretion)

Children in at risk groups should be vaccinated:

- those aged < 3 years require a reduced dose of vaccine
- those aged < 13 years require a second dose of vaccine 4-6 weeks later

The influenza vaccine

- it is an inactivated vaccine, so cannot cause influenza. A minority of patients however develop fever and malaise which may last 1-2 days
- should be stored between +2 and +8°C and shielded from light
- contraindications include hypersensitivity to egg protein.

- in adults the vaccination is around 75% effective, although this figure decreases in the elderly
- it takes around 10-14 days after immunisation before antibody levels are at protective levels

Respiratory tract infections: NICE guidelines

NICE issued guidance in 2008 on the management of respiratory tract infection, focusing on the prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care

A no antibiotic prescribing or delayed antibiotic prescribing approach is generally recommended for patients with acute otitis media, acute sore throat/acute pharyngitis/acute tonsillitis, common cold, acute rhinosinusitis or acute cough/acute bronchitis.

However, an immediate antibiotic prescribing approach may be considered for:

- children younger than 2 years with bilateral acute otitis media
- children with otorrhoea who have acute otitis media
- patients with acute sore throat/acute pharyngitis/acute tonsillitis when 3 or more Centor criteria are present

The Centor criteria* are as follows:

- presence of tonsillar exudate
- tender anterior cervical lymphadenopathy or lymphadenitis
- history of fever
- absence of cough

If the patient is deemed at risk of developing complications, an immediate antibiotic prescribing policy is recommended

- are systemically very unwell
- have symptoms and signs suggestive of serious illness and/or complications (particularly pneumonia, mastoiditis, peritonsillar abscess, peritonsillar cellulitis, intraorbital or intracranial complications)
- are at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- are older than 65 years with acute cough and two or more of the following, or older than 80 years with acute cough and one or more of the following:
 - - hospitalisation in previous year
 - - type 1 or type 2 diabetes
 - - history of congestive heart failure
 - - current use of oral glucocorticoids

The guidelines also suggest that patients should be advised how long respiratory tract infections may last:

- acute otitis media: 4 days
- acute sore throat/acute pharyngitis/acute tonsillitis: 1 week
- common cold: 1 1/2 weeks
- acute rhinosinusitis: 2 1/2 weeks
- acute cough/acute bronchitis: 3 weeks

*if 3 or more of the criteria are present there is a 40-60% chance the sore throat is caused by Group A beta-haemolytic *Streptococcus*

Hepatitis B

Hepatitis B is a double-stranded DNA virus and is spread through exposure to infected blood or body fluids, including vertical transmission from mother to child. The incubation period is 6-20 weeks.

Immunisation against hepatitis B (please see the Greenbook link for more details)

- contains HBsAg adsorbed onto aluminium hydroxide adjuvant and is prepared from yeast cells using recombinant DNA technology
- most schedules give 3 doses of the vaccine with a recommendation for a one-off booster 5 years following the initial primary vaccination
- at risk groups who should be vaccinated include: healthcare workers, intravenous drug users, sex workers, close family contacts of an individual with hepatitis B, individuals receiving blood transfusions regularly, chronic kidney disease patients who may soon require renal replacement therapy, prisoners, chronic liver disease patients
- around 10-15% of adults fail to respond or respond poorly to 3 doses of the vaccine. Risk factors include age over 40 years, obesity, smoking, alcohol excess and immunosuppression
- testing for anti-HBs is only recommended for those at risk of occupational exposure (i.e. Healthcare workers) and patients with chronic kidney disease. In these patients anti-HBs levels should be checked 1-4 months after primary immunisation
- the table below shows how to interpret anti-HBs levels:

Anti-HBs level (mIU/ml)	Response
> 100	Indicates adequate response, no further testing required. Should still receive booster at 5 years
10 - 100	Suboptimal response - one additional vaccine dose should be given. If immunocompetent no further testing is required
< 10	Non-responder. Test for current or past infection. Give further vaccine course (i.e. 3 doses again) with testing following. If still fails to respond then HBIG would be required for protection if exposed to the virus

Complications of hepatitis B infection

- chronic hepatitis (5-10%)
- fulminant liver failure (1%)
- hepatocellular carcinoma
- glomerulonephritis
- polyarteritis nodosa
- cryoglobulinaemia

Management of hepatitis B

- pegylated interferon-alpha used to be the only treatment available. It reduces viral replication in up to 30% of chronic carriers. A better response is predicted by being female, < 50 years old, low HBV DNA levels, non-Asian, HIV negative, high degree of inflammation on liver biopsy
- however due to the side-effects of pegylated interferon it is now used less commonly in clinical practice. Oral antiviral medication is increasingly used with an aim to suppress viral replication (not in dissimilar way to treating HIV patients)
- examples include lamivudine, tenofovir and entecavir

Hand, foot and mouth disease

Hand, foot and mouth disease is a self-limiting condition affecting children. It is caused by the intestinal viruses of the Picornaviridae family (most commonly coxsackie A16 and enterovirus 71). It is very contagious and typically occurs in outbreaks at nursery

Clinical features

- mild systemic upset: sore throat, fever
- oral ulcers
- followed later by vesicles on the palms and soles of the feet

Management

- general advice about hydration and analgesia
- reassurance no link to disease in cattle
- children do not need to be excluded from school*

*The HPA recommends that children who are unwell should be kept off school until they feel better. They also advise that you contact them if you suspect that there may be a large outbreak.

MRSA

Whilst tackling MRSA requires a multi-pronged approach the evidence base demonstrates that hand hygiene is the single most important step

Methicillin-resistant *Staphylococcus aureus* (MRSA) was one of the first organisms which highlighted the dangers of hospital-acquired infections.

Who should be screened for MRSA?

- all patients awaiting elective admissions (exceptions include day patients having terminations of pregnancy and ophthalmic surgery. Patients admitted to mental health trusts are also excluded)
- from 2011 all emergency admissions will be screened

How should a patient be screened for MRSA?

- nasal swab and skin lesions or wounds
- the swab should be wiped around the inside rim of a patient's nose for 5 seconds
- the microbiology form must be labelled 'MRSA screen'

Suppression of MRSA from a carrier once identified

- nose: mupirocin 2% in white soft paraffin, tds for 5 days
- skin: chlorhexidine gluconate, od for 5 days. Apply all over but particularly to the axilla, groin and perineum

The following antibiotics are commonly used in the treatment of MRSA infections:

- vancomycin
- teicoplanin

Some strains may be sensitive to the antibiotics listed below but they should not generally be used alone because resistance may develop:

- rifampicin
- macrolides
- tetracyclines
- aminoglycosides
- clindamycin

Relatively new antibiotics such as linezolid, quinupristin/dalfopristin combinations and tigecycline have activity against MRSA but should be reserved for resistant cases

Malaria: prophylaxis

There are around 1,500-2,000 cases each year of malaria in patients returning from endemic

countries. The majority of these cases (around 75%) are caused by the potentially fatal *Plasmodium falciparum* protozoa. The majority of patients who develop malaria did not take prophylaxis. It should also be remembered that UK citizens who originate from malaria endemic areas quickly lose their innate immunity.

Up-to-date charts with recommended regimes for malarial zones should be consulted prior to prescribing

Drug	Side-effects + notes	Time to begin before travel	Time to end after travel
Atovaquone + proguanil (Malarone)	GI upset	1 - 2 days	7 days
Chloroquine	Headache	1 week	4 weeks
	Contraindicated in epilepsy Taken weekly		
Doxycycline	Photosensitivity Oesophagitis	1 - 2 days	4 weeks
Mefloquine (Lariam)	Dizziness Neuropsychiatric disturbance	2 - 3 weeks	4 weeks
	Contraindicated in epilepsy Taken weekly		
Proguanil (Paludrine)		1 week	4 weeks
Proguanil + chloroquine	See above	1 week	4 weeks

Pregnant women should be advised to avoid travelling to regions where malaria is endemic. Diagnosis can also be difficult as parasites may not be detectable in the blood film due to placental sequestration. However, if travel cannot be avoided:

- chloroquine can be taken
- proguanil: folate supplementation (5mg od) should be given
- Malarone (atovaquone + proguanil): the BNF advises to avoid these drugs unless essential. If taken then folate supplementation should be given
- mefloquine: caution advised
- doxycycline is contraindicated

It is again advisable to avoid travel to malaria endemic regions with children if avoidable. However, if travel is essential then children should take malarial prophylaxis as they are more at risk of serious complications.

- diethyltoluamide (DEET) 20-50% can be used in children over 2 months of age
- doxycycline is only licensed in the UK for children over the age of 12 years

Post-exposure prophylaxis

Hepatitis A

- Human Normal Immunoglobulin (HNIG) or hepatitis A vaccine may be used depending on the clinical situation

Hepatitis B

- HBsAg positive source: if the person exposed is a known responder to HBV vaccine then a booster dose should be given. If they are in the process of being vaccinated or are a non-responder they need to have hepatitis B immune globulin (HBIG) and the vaccine
- unknown source: for known responders the green book advises considering a booster dose of HBV vaccine. For known non-responders HBIG + vaccine should be given whilst those in the process of being vaccinated should have an accelerated course of HBV vaccine

Hepatitis C

- monthly PCR - if seroconversion then interferon +/- ribavirin

HIV

- a combination of oral antiretrovirals (e.g. Tenofovir, emtricitabine, lopinavir and ritonavir) as soon as possible (i.e. Within 1-2 hours, but may be started up to 72 hours following exposure) for 4 weeks
- serological testing at 12 weeks following completion of post-exposure prophylaxis
- reduces risk of transmission by 80%

Varicella zoster

- VZIG for IgG negative pregnant women/immunosuppressed

Estimates of transmission risk for single needlestick injury

Hepatitis B 20-30%

Hepatitis C 0.5-2%

HIV 0.3%

Antibiotic guidelines

The following is based on current BNF guidelines:

Respiratory system

Exacerbations of chronic bronchitis Amoxicillin or tetracycline or clarithromycin

Uncomplicated community-acquired pneumonia Amoxicillin (Doxycycline or clarithromycin in penicillin allergic, add flucloxacillin if staphylococci suspected e.g. In influenza)

Pneumonia possibly caused by atypical pathogens Clarithromycin

Urinary tract

Lower urinary tract infection	Trimethoprim or nitrofurantoin. Alternative: amoxicillin or cephalosporin
Acute pyelonephritis	Broad-spectrum cephalosporin or quinolone
Acute prostatitis	Quinolone or trimethoprim

Skin

Impetigo	Topical fusidic acid, oral flucloxacillin or erythromycin if widespread
Cellulitis	Flucloxacillin (clarithromycin or clindomycin if penicillin-allergic)
Erysipelas	Phenoxymethylpenicillin (erythromycin if penicillin-allergic)
Animal or human bite	Co-amoxiclav (doxycycline + metronidazole if penicillin-allergic)

Ear, nose & throat

Throat infections	Phenoxymethylpenicillin (erythromycin alone if penicillin-allergic)
Sinusitis	Amoxicillin or doxycycline or erythromycin
Otitis media	Amoxicillin (erythromycin if penicillin-allergic)
Otitis externa*	Flucloxacillin (erythromycin if penicillin-allergic)

Genital system

Gonorrhoea	Cefixime or ciprofloxacin**
<i>Chlamydia</i>	Doxycycline or azithromycin
Pelvic inflammatory disease	Oral ofloxacin + oral metronidazole or intramuscular ceftriaxone + oral doxycycline + oral metronidazole
Syphilis	Benzathine benzylpenicillin or doxycycline or erythromycin
Bacterial vaginosis	Oral or topical metronidazole or topical clindamycin

*a combined topical antibiotic and corticosteroid is generally used for mild/moderate cases of otitis externa

**there is actually now significant resistance to ciprofloxacin and other guidelines recommend cefixime 400mg PO (single dose) or ceftriaxone 250mg IM