

Blood-borne viruses and STIs: might this patient be positive? Epidemiology and transmission

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Introduction

Early diagnosis is important for all treatable conditions. Early identification of sexually transmitted infections (STIs) and blood-borne viral infections (BBVs) in particular can facilitate both treatment and prevention. Therapy for human immunodeficiency virus (HIV) infection can postpone immune damage and thereby prevent development of opportunistic infections and malignancies, treatment of treatable STIs prevents sequelae and reduces transmission, while improved therapies for hepatitis B virus (HBV) and hepatitis C virus (HCV) can clear the virus and improve clinical outcomes in some individuals. In addition to providing the benefits of treatment, early diagnosis, accompanied by relevant education, can help to reduce the rate of ongoing transmission of STIs, HIV, HBV and HCV.

Diagnosis of each of these infections generally requires simple tests. However, indications for testing are frequently overlooked and opportunities for early diagnosis are missed. The decision to test should be based on a detailed history of risk behaviour as well as a physical examination of the patient. It should always be borne in mind that people may prefer to conceal a history of risk taking especially when it concerns sex, drugs or both. Consequently, a low threshold for testing should be maintained. Individuals infected with a blood-borne virus who do not report high-risk behaviours are more likely to present with advanced disease. Late presentation has been associated with poor clinical outcomes, particularly in relation to HBV and HIV.

An understanding of the epidemiology and transmission of both blood-borne viruses and other STIs, along with a detailed behavioural history, will help make an accurate assessment of the likely risk of infection, and guide appropriate testing.

Blood-borne viruses (HIV/HBV/HCV): prevalence and risk factors for transmission

Although HIV, HBV and HCV are all blood-borne viruses, the efficiency of transmission in different settings varies enormously (Table 2.1). Transmission will depend on many factors, including the infectivity of the source (e.g. the viral load of HIV, HBV or HCV) and the type of exposure.

The clearest example of the differences in transmissibility of these three viruses is sexual contact. Unprotected anal or vaginal sex with a person who has the infection carries a high-risk of transmission for both HIV and HBV but a very low risk of transmission for HCV (Table 2.1).¹

Key points

- HIV and HBV are transmitted through sexual contact, as well as blood-to-blood contact and from mother to child. HCV is transmitted by blood-to-blood contact.
- STIs are transmitted through various forms of sexual contact including all oral sexual activities.
- In Australia, the prevalence of HIV, HBV and HCV is high among particular groups. However, risk exposure, rather than group membership, should be the basis for risk assessment.
- In Australia and New Zealand, the prevalence of genital chlamydial infection is high in young sexually active people. Most early infection is asymptomatic so screening for chlamydia in primary care practice is vital.
- The decision to test should be based on an assessment of risk as well as physical examination. Some people may prefer not to reveal a history of risk behaviour, and a low threshold for testing should be maintained.
- People with a blood-borne virus infection who do not report high-risk behaviours are more likely to present late and to suffer resultant poor clinical outcomes.

TABLE 2.1 Risk of HIV, HBV and HCV transmission (from a known positive source)

	HIV	HBV ^a	HCV ^b
Sexual contact			
Unprotected anal (receptive)	very high	very high	very low ^c
Unprotected anal (insertive)	high	very high	very low ^c
Unprotected vaginal	high ^d	very high	very low ^c
Unprotected oral (cunnilingus and fellatio, receptive and insertive)	very low	low-moderate	negligible
Mother to child (perinatal)			
No intervention	20-45%	30-90%	5% ^e
With intervention	<5% ^f	<5% ^g	NA ^h
Occupational exposure (needle-stick)			
	0.3%	20-40%	2-10%
Sharing injecting equipment among IDUs			
	very high	very high	extremely high ⁱ
Unsterile tattooing and piercing			
	high	very high	very high
Unsterile medical and other procedures			
	high	high	high

a Refers to chronic hepatitis B (HBsAg+), with higher risk where source is HBeAg+ and/or HBV DNA+.

b Refers to chronic hepatitis C (HCV RNA+).

c Higher risk may be associated with certain practices or circumstances where there is the possibility of blood-to-blood contact (e.g. traumatic sexual practices, sex during menstruation) or high HCV viral load (e.g. HIV co-infection).

d Some evidence of higher risk for male-to-female than female-to-male transmission.

e Higher risk (15–20%) in presence of HIV/HCV co-infection, related to higher HCV viral load.

f Proven interventions include antiretroviral therapy, caesarean section and avoidance of breastfeeding.

g Intervention includes HBV immunoglobulin and vaccination.

h There is no currently proven intervention for perinatal HCV transmission.

i Some evidence of HCV transmission when sharing injecting equipment other than needles (e.g. spoons, tourniquets).

The explanation for this disparity is the absence (or extremely low concentration) of HCV found in semen or vaginal secretions, in contrast to the high levels of both HIV and HBV in these bodily fluids.²

There are also differences in perinatal transmissibility of HIV, HCV and HBV. HCV has a relatively low efficiency of transmission in the perinatal setting; only 5% of infants born to women with HCV will become infected, with factors such as maternal viral load and duration of labour affecting risk of transmission. Without intervention, mother-to-child transmission of HIV and HBV is common. In the absence of prophylaxis, rates of mother-to-child transmission of hepatitis B are very high, particularly from HBeAg-positive mothers with high viral load (more than 85% transmission). Thus, routine HBsAg testing is recommended in all pregnant women, and both passive (hepatitis B immunoglobulin) and active (hepatitis B vaccination) is given to the baby within 12 to 24 hours of birth.

This strategy is thought to be over 95% effective in preventing neonatal infection. The rate of HIV mother-to-child transmission without intervention is 25%.

However, proven interventions can reduce the risk of perinatal transmission of HIV to 1–2%³ and HBV to less than 5%.³⁻⁵

In contrast to the lower efficiency of HCV transmission through sexual contact, HCV is more efficiently transmitted than HIV or HBV through blood-to-blood contact where injecting equipment (including swabs, spoons, water, tourniquets, needles and syringes) is shared.⁶

The likelihood of transmission after a specific exposure is also related to the risk of infection in the source. Although transmission of blood-borne viruses is associated with certain risk behaviours, prevalence rates are higher in specific groups in Australia: HIV in men who have sex with men (MSM); HBV and HCV among injecting drug users; HBV in Indigenous Australians and Asian-born populations; and all three viruses in people with haemophilia treated with clotting factor replacement therapy prior to 1990 (Table 2.2). The low prevalence of HIV in people other than homosexual men in Australia accounts for the relatively low risk of HIV infection after unprotected heterosexual exposure and sexual assault.

The prevalence of HCV is very high among persons who have ever injected drugs, and use of injecting equipment that has been contaminated with HCV-infected blood carries a very high risk of transmission. Consequently, infection is common after even a small number of exposures, such as the occasional sharing of injecting equipment.

The global HIV epidemic and its implications for Australia

Outside Australia, the patterns of HIV transmission are extraordinarily diverse. Many countries in Europe and North America are seeing extensions of the HIV epidemic into ethnic and social minorities, immigrant groups and the socially disadvantaged. HIV infection levels in injecting drug users are often very high. In much of sub-Saharan Africa, HIV is extremely prevalent, reaching 30–40% in young adults in some countries. High rates of genital ulceration and poor access to medical services and preventative education account, in part, for high-prevalence rates. In some communities in Australia (particularly remote Aboriginal communities) and in some of our nearest neighbours (including Papua New Guinea), the same combination of factors exists (poverty, marginalised populations, high rates of STIs) that have allowed such explosive epidemics in other countries.

In Asia, four countries (Thailand, Myanmar, Indonesia and Cambodia) have adult prevalence rates over 1% and within these countries there are certain populations, particularly injecting drug users and sex workers, with much higher HIV prevalence. In addition, expanding HIV epidemics in India and China are of increasing concern. Travellers to regions of high-prevalence of HBV or HIV should be informed of the risks of acquiring these infections through sexual or accidental exposure.

The global pattern of HIV infection is beginning to be reflected in the pattern of heterosexual HIV transmission in Australia. Immigrants from high-prevalence countries and their partners feature prominently among those newly diagnosed, as do visitors to high-prevalence regions. During 2001 to 2005, 57% of people who acquired HIV through heterosexual contact were from a high-prevalence country or had reported heterosexual contact with a partner from a high-prevalence country.¹⁸

CASE STUDY 1

Clinical assessment: cough and fever may indicate a HIV-related illness

Cough and fever

Jessica is a 37-year-old secretary who presents to her GP with a recent onset of cough and fever. Brief chest examination is unremarkable and she is prescribed five days of amoxicillin. She re-presents three weeks later with marked shortness of breath, weakness and fatigue. Chest X-ray shows signs consistent with a diffuse pneumonitis and she is admitted to hospital. Jessica's HIV antibody test is positive (ELISA and Western Blot) and she has a CD4 cell count of 25 cells/ μ L and a HIV viral load of 500 000 copies/mL. Upon presumptive treatment for *Pneumocystis jiroveci* pneumonia (PCP), the cough resolves and chest X-ray normalises. Jessica is commenced on triple combination antiretroviral therapy that she tolerates well. One year after presentation, she remains well on antiretroviral therapy and PCP prophylaxis.

CASE STUDY 2

Risk assessment: non-disclosure of high-risk sexual activity

Sexual risk activity

A 29-year-old garage mechanic visits his GP complaining of a purulent urethral discharge. He seems open, personable and readily admits to having many sexual partners in the past—mostly casual 'one-night stands'—with whom he usually uses condoms. However, at the time of presentation, he has been with his current girlfriend for over a year and the couple no longer use condoms. The man reports that while his girlfriend was away last weekend, he went to a nightclub and met a woman with whom he had sex. He was very drunk and is unsure whether a condom was used. He tested negative to an HIV antibody test two years ago in another city. He denies any same-sex partners or injecting drug use.

The GP conducts a screening for STIs, including urethral swabs, and suggests blood tests for HIV, syphilis and HBV. The man seems a bit resistant to the idea at first, but then agrees. He accepts a script for ciprofloxacin and azithromycin and agrees to return in one week for his results.

The man's urethral swab grows *Neisseria gonorrhoeae*, as expected, but his HIV antibody test is also positive. All other tests are negative. The young man is shocked at the news. He admits that he did not tell the full truth on his previous visit; in fact, most of his casual partners have been male. He reports both insertive and receptive anal sex without condoms and says he is most likely to seek casual sex when he has been drinking heavily.

TABLE 2.2 Seroprevalence estimates for HIV, HBV and HCV in Australia^a

	HIV	HBV ^b	HCV
Injecting drug users	1-2% ^c	40-50% ^d	50-60% ^c
Sexual orientation			
Homosexual/bisexual men	5-10% ^e	40-50% ^d	5-7% ^f
Homosexual/bisexual women	<1%	2-5% ^f	2-5% ^f
Heterosexual men	<1%	1-2%	1-2%
Heterosexual women	<1%	1-2%	1%
Ethnicity			
Indigenous Australian	<1% ^g	20-30% ^h	2-5% ⁱ
Asian	<1%	20-30% ^h	2-5% ^j
Other	<1%	1-2%	1-2%
Health care workers^k	<1%	1-2%	1-2%
Recipients of blood products^l			
People with clotting disorders ^m	20-30%	50-60% ^g	0-80%
Other	1%	1-2%	2-5%

- a) Some of these estimates are based on limited data, and should be considered as guides to levels of infection rather than true prevalence values.
- b) Based on prevalence of anti-HBc, indicating previous exposure. Approximately 95% of people exposed to HBV as adolescents and adults clear HBV infection (HBsAg- and anti-HBs+) and are immune to re-infection.
- c) Based on HCV antibody prevalence from the National Needle and Syringe Program Survey Report 2002-2006.⁷
- d) Prevalence of chronic hepatitis B (HBsAg+) estimated to be 2–3%.^{8,9}
- e) Based on self-reported HIV status among gay men at gay community fair days in Australian capitals.¹⁰
- f) Higher prevalence estimates than heterosexual groups due to higher prevalence of injecting drug use.^{11,12}
- g) Despite higher rates of other STIs, HIV prevalence is similar among indigenous and non-indigenous Australians.¹³
- h) The majority of transmission occurs during the perinatal period or early childhood, therefore the estimate for chronic hepatitis B (5–10%)¹⁴ is higher than for other high-risk groups (2–3% for IDU, homosexual men).
- i) Higher estimate due to increased prevalence of injecting drug use and incarceration.¹⁵
- j) Higher estimate due to probable increased exposure through non-sterile medical, dental and other skin penetration procedures in non-Australian born Asians. Higher estimated prevalence in people born in other selected, high prevalence countries (e.g. Italy, Egypt).
- k) Although cases of occupational transmission of blood-borne viruses have been reported, including five cases of HIV¹⁶, prevalence of HIV, HBV and HCV is estimated to be similar to the general population.
- l) In Australia, screening for HBV was introduced in the early 1970s, HIV in 1985, and HCV in 1990.
- m) Includes people with haemophilia A, haemophilia B, and von Willebrand's disease. In general, prevalence rates increase with severity of clotting disorder and age (due to introduction of screening).¹⁷

Other STIs: prevalence and transmission

Genital chlamydial infection

The rate of chlamydia infections has been steadily rising over the last decade. Increased testing and the availability of nucleic acid amplification tests (NAATs) such as polymerase chain reaction (PCR), that are easier to perform, and have greater sensitivity than the culture of the organism, could account for some of the increase, but it is not thought to be the sole reason. We

are not winning the battle against genital chlamydial infection. The common form of genital chlamydial infection is due to *Chlamydia trachomatis* serovars D to K causing urethral, cervical and rectal infections. The Australia-wide notification rate of infections per 100,000 population has doubled in five years from 109 in 2001 to 217 in 2005. In 2006 in Victoria alone there were 10,000 infections notified. This is a disease of younger people aged 15 to 39 years (more sexual activity, more partners), but is most commonly diagnosed in the 20 to 29 year groups—females more than males.^{19,20}

Lymphogranuloma venereum (LGV) is caused by *Chlamydia trachomatis* serovars L1, L2 and L3. It is very uncommon in Australia, however, in recent years, there has been a small cluster of cases in very sexually active men who have sex with men (MSM). It is prudent, therefore, to consider the possibility of LGV in an MSM patient who has symptomatic chlamydial proctitis or where *C. trachomatis* is detected by NAAT on routine rectal screening in an MSM (see Chapter 12: Primary Care Management of STIs). Clinicians will need to discuss with their local laboratory the issue of specific testing for LGV, should the need arise.

Genital herpes

Genital herpes is not a notifiable disease. The general population prevalence in Australasia is 12–20%. It is higher in MSM and sex workers. The majority of people with genital herpes are unaware that they have the infection. They have either sub-clinical infection, i.e. they have mild recurring symptoms that they do not recognise as herpes, or they have truly asymptomatic infection.

HSV-2 normally has its latent phase in the sacral ganglia. The cause of genital herpetic infection has changed, with approximately 50% of genital herpes diagnosed today caused by HSV-1 (the virus commonly associated with oral herpes which normally has its latent stage in the trigeminal ganglia).^{21,22}

Genital warts and human papillomavirus (HPV)

Human papillomavirus (HPV) infection is so common in the community that acquiring one of the many genital types of HPV is virtually synonymous with having sex. The point prevalence in the 15 to 25-year-old group is approximately 25% for genital HPV. There are many types of HPV with approximately 40 types site-specific to the genitals. The HPV types 6 and 11 are the causative viruses for the majority (90%) of genital warts. Ten to 15% of adults will get genital warts in their lifetime, causing much anxiety and stress. HPV can be carried asymptotically, an important fact to explain to patients when they are concerned where their infection might have come from. There are approximately 15 types of HPV which are associated with dysplastic changes in the genital region, especially at the transformation zones of the cervix and the anal canal. Types 16 and 18 cause 70–80% of cervical cancer in Australia and are implicated in the development of anal squamous carcinoma as well. In Australia a vaccine for types 6, 11, 16 and 18 is now on the immunisation schedule for young women. It is also licensed on the basis of immunogenicity for young boys aged nine to 15, but is not available free on the immunisation schedule for men as there are not yet any clinical trial data on its efficacy in preventing infection or disease in men. This new vaccine should reduce the rate of infection with these four HPV types in years to come, and reduce the incidence of cervical cancer. Vaccinated women should continue screening for cervical cancer

CASE STUDY 3

Sexual health context: an STI indicates the need for HIV testing

STIs

A young, openly gay man in a regional city presents to a GP with a four-day history of a very painful anus, which he assumes to be haemorrhoids, as he has suffered them previously. He says he has never had anal sex. On examination, there are extensive perianal ulcers and the GP takes swabs for herpes, gonorrhoea and chlamydia. The young man is appalled that he could have an STI, and the GP encourages him to talk about his sexual history. The patient states that he only ever has safe sex and has never had an STI. He reports a negative HIV antibody test about two years ago and he has been vaccinated successfully against HBV. He averages about three different sexual partners a month at the local beat and he has never injected. Upon further questioning about his sexual behaviour, the patient reports that he and his most recent partner had done 'just about everything two guys can do, short of fucking'. When questioned, he agrees that there had been some oral-anal contact 'both ways'. The GP suggests pharyngeal and anal swabs and raises the issue of HIV testing. The patient readily agrees. The anal swab returns positive for Herpes Simplex Virus (HSV) type 1 but cultures for gonorrhoea and the HIV antibody test are negative.

CASE STUDY 4

HCV prevalence and transmission: past injecting drug use may have caused infection

Past injecting drug use

Angeli is a 29-year-old solicitor who is four-months pregnant. Upon routine testing, her GP discovers that Angeli has abnormal liver function tests (ALT 68 IU). She is otherwise in perfect health. She presents with her husband and reports no risk factors for HBV or HCV infection and is unvaccinated for HBV. She describes herself as 'healthy and clean-living'. Upon investigation, it is discovered that Angeli is anti-HBc-negative but HCV antibody positive. When seen on her own, Angeli reports that she injected amphetamines on 'one or two occasions' at age 19, while a university student. Although she does not recall sharing injecting equipment, she admits that the memories are very hazy as she had been drinking on those occasions and had allowed a friend to inject her. She has told no one about this past drug use, not even her husband, whom she fears will not understand. She is deeply upset that this brief experimentation has come back to haunt her current life and health, and she has fears that it could affect her husband's and baby's health. She initially requires HCV RNA PCR testing to confirm that her abnormal liver function tests do represent active hepatitis C infection. She is much relieved to hear, however, that even if her HCV RNA test is positive the risk of transmission to her baby is quite low and that transmission to her partner very unlikely.

with regular Papanicolaou smears, as the vaccine does not cover all cancer associated types of HPV. It is not currently recommended for men in the prevention of anal cancer. Further studies using the vaccine in MSM are awaited.^{21,22}

Gonorrhoea

Gonorrhoea has been slowly increasing over the last decade. It is mainly seen in MSM, Indigenous people, overseas people particularly from South East Asia, and in recently returned travellers who have had sex (either heterosexual or homosexual) with a local person in a country where gonorrhoea is endemic. The overall rate of infection in Australia in 2006 was 42 per 100,000, representing a rise of 27% for both men and women between 2002 and 2006. The rate of gonorrhoea in men has been consistently a little more than double that in women over the past five years, a reflection of the substantial contribution MSM make to gonococcal infection rates in Australia.²⁰ The majority of gonorrhoea diagnosed is urethral and rectal.^{19,20}

Syphilis

Syphilis is another infection that has been steadily on the rise. Syphilis has for a long time been prevalent in Australia's Indigenous population. It is now often seen in MSM as well and, in recent years, the rates of syphilis in Victoria and Queensland have risen, entirely due to homosexually acquired infection, while in NSW syphilis rates have actually slightly declined. In the Northern Territory, after a welcome reduction in the syphilis rate since the beginning of the new century (while rates in the non-Indigenous population have continued to decline in the past three years), there has been a rise in infectious syphilis in the Northern Territory's Indigenous population.²⁰

Due to the chronicity of untreated infection and the often long latent periods characteristic of syphilis, this is an infection which can be diagnosed in any age. Indeed, it remains in the differential diagnosis for dementia.^{19,20}

Trichomoniasis

Trichomoniasis is not a notifiable infection in any state in Australia. Infection due to *Trichomonas vaginalis* is most prevalent in the Indigenous population or in returned travellers from higher prevalence countries. Infection is often asymptomatic in both sexes. Symptomatic infection may occur in women but is very rare in men. It is still essential to treat both partners when a woman is diagnosed with trichomonal infection.^{19-21,23}

Risk assessment: Might this patient be positive for an STI or a blood-borne virus?

Risk assessment is based on a thorough history of the patient's sexual practices, drug use, tattoos and piercings, medical history relating to vaccination, use of blood products in Australia (prior to 1985 for HIV and 1990 for HCV) and possible medical exposure overseas.

The history should be taken in a manner that enables the patient to discuss recent and remote risks and exposures (see Chapter 3).

While taking a complete history may not be an option at every general practice consultation, it may be possible to accrue this information over a period of time. Alternatively, the patient could be offered a follow-up appointment to allow risk assessment to be completed.

When faced with a person who is identifiably at high risk, e.g. an openly gay man or an opiate-dependent drug user, the possibility of infection with a blood-borne virus is a possibility. For sexually active homosexual men, national guidelines recommend at least annual screening for gonorrhoea and chlamydia, syphilis and HIV, and screening and vaccination for hepatitis A and B.²⁴ However, as transmission is linked to risk behaviours rather than group membership, considering the possibility of infection with STIs or blood-borne viruses only in persons from 'high-risk groups' is likely to lead to undetected infections.

Many people who are from 'high-risk groups' remain at very low risk because of the nature of their sexual or drug-use practices, while those from perceived 'low-risk groups' may undertake high-risk behaviours.

A person may not provide truthful or accurate information regarding risk behaviours for several reasons including:

- Experience of discrimination within the health system and from health care workers on the basis of drug use or sexual behaviour
- Non-acceptance of his or her own behaviours and an inability to discuss these behaviours with any other person, even a health professional
- The desire to disassociate from past risk behaviours
- Cultural shame and language barriers
- Fear that confidentiality will be breached

A minority of people may not report high-risk behaviour at all. They may simply have had an unprotected heterosexual encounter (which has transmitted HIV) with someone whose own previous high-risk behaviour is unrecognised. Many HIV-infected women fall into this category. Making the diagnosis in these situations is dependent on retaining an open mind about the possibility of infection.

Risk assessment for STIs

In assessing any patient, it is important to consider whether they could have an STI and to maintain a low threshold for screening for STIs. The reasons are as follows:

- STIs are often asymptomatic in both sexes
- Infections with other STIs increase the risk of acquisition and transmission of HIV. This is particularly so for ano-genital ulcer disease (GUD)
- Unlike HIV, STIs can be transmitted through means other than unprotected anal and vaginal sex, e.g. by oral sexual activities and by genital skin to skin contact

- A person can contract more than one STI at a time. If patients are diagnosed with one STI it is prudent to screen them for others
- STIs can be debilitating for a patient's health as well as causing psycho-social and relationship issues. Some STIs and the complications they manifest, such as chronic pain syndromes, abscesses, infertility or life threatening problems such as ectopic pregnancy, have broad ranging sequelae
- Diagnosing an unexpected STI in an index patient indirectly has potential health benefits for their sexual partner(s)

It is helpful to know about the epidemiology of particular STIs, as the risk of some STIs is more common amongst some groups than others. It is beneficial to the patient and the public purse to know when to investigate and when not to carry out unnecessary tests just for the sake of completeness. This section explores some of the common STIs that patients should be tested for if the person is symptomatic.^{21-23,25} How to manage the symptomatic patient is discussed in Chapter 12.

A history from the patient should be thorough (Table 2.3). Some of these issues will need to be discussed each time the patient comes to see you; others will be part of the past history and will need to be followed up as information is collected during subsequent visits.

Clinical assessment: Might this patient have a blood-borne virus or an STI?

Many patients with STIs or with chronic HIV, HBV or HCV infection are asymptomatic. The diagnosis relies on the clinician retaining an index of suspicion in all clinical situations, and on a thorough assessment of risk.

Patients with acute HIV, HCV, HBV, and hepatitis A virus (HAV), disseminated gonococcal infection, primary herpes infection and secondary syphilis may present with systemic symptoms (Chapters 4 and 5). HIV, secondary syphilis or viral hepatitis should be considered in any patient with a febrile illness, particularly if there is a possibility of recent exposure to one of these pathogens. When symptoms of chronic infection with blood-borne viruses occur, they are often non-specific (e.g. fatigue, myalgia and fevers).

Symptoms and signs of moderately advanced HIV infection include weight loss, chronic diarrhoea, fevers, lymphadenopathy, oral candidiasis, seborrheic dermatitis, herpes zoster, frequent or severe recurrent oral or genital herpes and oral hairy leukoplakia (Chapter 6).

Symptoms and signs of early chronic viral HBV and HCV infection are more non-specific and include intermittent or chronic fatigue, abdominal discomfort and headaches. Symptoms and signs of more advanced

TABLE 2.3 Issues raised in a consultation that may cause a clinician to think further investigation for STIs is warranted

<ul style="list-style-type: none"> • Diagnosis of another STI: HIV, Hepatitis B, chlamydia, gonorrhoea, HSV, trichomoniasis, syphilis
<ul style="list-style-type: none"> • Sexual history: multiple partners, unprotected sexual intercourse whether anal, oral or vaginal, recent change of partner (in the last year), high-risk partners (IDU; from a high prevalence country for HIV and other STIs; bisexual), multiple partners
<ul style="list-style-type: none"> • Sex workers: particularly working in an environment where regular medical check ups are not encouraged or regulated, e.g. street sex workers will be at much higher risk of STIs
<ul style="list-style-type: none"> • Victims of sexual assault: although in Australia the risk of HIV is low in this situation, for other STIs (especially chlamydia) the risk is higher. If a patient is seen directly after a sexual assault, think of prophylactic azithromycin and emergency contraception if a female has been vaginally assaulted by a male. There may be some instances where post-exposure prophylaxis against HIV is recommended, e.g. a male rape of a male
<ul style="list-style-type: none"> • Pregnancy: especially unwanted or in an adolescent—by definition they have had unprotected sex
<ul style="list-style-type: none"> • Infertility: previous pelvic inflammatory disease is always a possible cause of infertility; often too late by this stage but check especially for chlamydia
<ul style="list-style-type: none"> • Symptomatic patient (i.e. a patient with genital symptoms) – see Chapter 12: Primary care management of STIs

chronic viral hepatitis include the exanthemata of chronic liver disease (palmar erythema, spider naevi), while decompensated cirrhosis (liver failure) is associated with the development of ascites, splenomegaly and abdominal venous distension (Chapters 6 and 7).

Some early STIs are usually asymptomatic, while symptoms and signs of complications of STIs vary depending on the clinical condition (see Chapter 12: Primary care management of STIs).

Testing of patients: when should you think to test?

This section contains a check list which provides a rough guide for testing for specific STIs.^{21-23,25,26} For sexually active MSM, national guidelines recommend at least annual testing for chlamydia, gonorrhoea, syphilis, HIV, and an initial screen and vaccination if necessary for hepatitis A and B.²⁴ The reader should consult Chapter 8 for testing methods and appropriate anatomical testing sites.

Chlamydia

- Pregnancy – especially if unplanned or unwanted (or if having a termination of pregnancy)
- Sexually active patient under 25 years old – screen at least annually
- Change of partner
- Multiple partners
- Report of unprotected sexual intercourse
- Diagnosed with another STI
- Indigenous person, if not screened in the past 12 months
- MSM – think of testing for chlamydia in all MSM as it is a common anogenital infection in homosexually active men. LGV strains of chlamydia (L1 to L3) can cause a moderate to severe proctitis in MSM. Clinicians will need to discuss with their local laboratory the issue of specific testing for LGV should the need arise
- Sexual assault
- Sex workers (required as part of issuing a certificate); especially street sex workers

Gonorrhoea

- MSM: this group is at substantially higher risk of gonorrhoea than the rest of the general Australian community
- History of sex with someone recently arrived from a high-prevalence country (e.g. India, South East Asia)
- Patient recently arrived from a high-prevalence country (e.g. India, South East Asia)
- Indigenous person, if not screened in the past 12 months
- Sex workers (required as part of issuing a certificate); especially street sex workers.

Herpes

- Symptomatic: nucleic acid amplification test (NAAT) testing from any suspicious lesions
- HIV-positive patients: type specific serology (see Chapter 8)
- Some specific clinical situations: type specific serology, e.g. discordant couples, especially if heterosexual – female with no history of herpes, male with a past history of genital herpes and couple are wanting a pregnancy

Genital warts and human papillomavirus

- Clinical diagnosis only: there is no screening available for genital warts
- Papanicolaou smears important in all women (see NHMRC guidelines): yearly for HIV-positive women
- HPV DNA testing for high-risk HPV subtypes is expensive and is used by specialist gynaecology hospital units in the management of cervical pathology. HPV DNA testing is recommended by the NHMRC and funded through the MBS as a 'test of cure' following treatment of high-grade squamous epithelial lesions (HSIL) of the cervix. It is not recommended as a primary screening test for HPV infection or cervical cancer.

Trichomoniasis

- Sex workers
- Women with a vaginal discharge
- Indigenous women
- History of sex with someone from a high-prevalence country
- Patient is recently returned from a high-prevalence country and had unprotected sexual intercourse with a local person in that country

Syphilis

- MSM
- HIV-positive patients
- Sex workers
- Indigenous persons
- Pregnant or if planning a pregnancy

HIV and the sexual health context

A person diagnosed with an STI is likely to be at increased risk of HIV infection. An STI can be a marker of recent or past risk and genital inflammation itself may have put the individual at higher risk of HIV infection. A full assessment of a person with an STI includes HIV, HBV and often HCV antibody testing.

HIV risk should be considered in all patients who present with an STI. Although the diagnosis of a heterosexually acquired STI is unlikely to be accompanied by HIV infection in Australia, the presence of an STI calls at least for careful clinical assessment of the actual risk with the informed cooperation of the person. There is a medical and legal imperative to fully investigate any patient diagnosed with an STI or blood-borne viral infection (Chapter 14). Failure to diagnose an STI can lead to ongoing transmission as well as clinical progression.

More than 20 years into the HIV epidemic, there is some evidence that 100% consistent use of condoms is becoming less common among gay men in Australia.¹⁰ Since the mid 1990s, surveys have reported increasing levels of unprotected anal intercourse with casual

CASE STUDY 5

HBV transmission: perinatally acquired infection

HBV prevalence and transmission

Aaron is an 18-year-old student who consults his GP for hepatitis B vaccination. Pre-vaccination screening reveals that he is anti-HBc+ and HBsAg+. Aaron was born in Australia and his parents are university academics who arrived in Australia from south-eastern China in the mid-1970s. He is not aware of any hepatitis in the immediate family but his grandmother died of liver problems at a very old age. Due to Aaron's potential infectivity, his GP advises him to discuss his HBV-positive status with his girlfriend and housemates. He is also advised to discuss his HBV status with his family, with a view to their subsequent HBV testing. Due to the possibility of perinatally acquired infection, his GP stresses the particular importance of HBV testing for his mother.

partners among MSM, and surveillance data reveal increasing rates of gonorrhoea and syphilis in these populations.⁷ Over the past five years, the rates of diagnosis of HIV infection have increased substantially in Victoria, Queensland, South Australia and Western Australia, but not in New South Wales.²⁷ Regular testing for gonorrhoea and other STIs in MSM who have casual sexual partners should be a routine part of clinical care. All gay and bisexual men should be assessed for HAV and HBV immunity and vaccinated if necessary. As well, clinicians looking after people living with HIV should recommend regular STI screening for their sexually active patients with HIV infection.

In addition to triggering consideration of HIV and HBV infection, the presence of an STI provides the primary care clinician with the opportunity to take a sexual history and promote safer sex practices (Chapter 3).

Prevention strategies

There are several proven means of reducing the efficiency of transmission of STIs, HIV, HBV and HCV (Table 2.4). The use of condoms for anal or vaginal sex and the use of clean injecting equipment remain the most effective means of prevention of transmission of HIV (Chapter 3). Similarly the use of condoms for anal and vaginal sex will significantly reduce the risk of most STIs. Because STIs may be transmitted through oral sex and because condoms are not 100% effective, however, clinicians should recommend regular sexual health check-ups for their sexually active patients, including screening for common STIs (see Chapter 8). The use of

sterile injecting equipment is the most effective means of preventing HCV transmission.

Other interventions such as post-exposure prophylaxis may also have a role in prevention, particularly for HIV (Chapter 4). Antiretroviral therapy, caesarean section and avoidance of breast-feeding have reduced the risk of perinatal transmission of HIV to 1–2%.³ Antenatal testing of women for common STIs and STIs with significant infant morbidity (e.g. syphilis) is an important measure for reducing risk of vertical transmission. HBV vaccination is safe and extremely effective. Nevertheless, many people at risk of infection remain unvaccinated in Australia. The search is currently underway for effective HIV and HCV vaccines, but these may be many years away. A vaccine against herpes simplex virus infection is urgently needed because of the synergistic effect of this infection on HIV transmission. Development of vaccines against other common STIs has unfortunately never been accorded high priority, no doubt a reflection of the ongoing stigmatised nature of these conditions.

Summary

STIs, HIV, HBV and HCV are different and distinct infections in terms of epidemiology and risk factors for transmission, although there are some similarities in the modes of transmission. The recommendation to test for common and significant STIs, HIV, HBV and HCV should be based on reported risk factors for transmission or the presence of clinical signs. A low threshold for testing is advised due to the reluctance of some people to disclose risk behaviours or their failure to identify risks.

TABLE 2.4 Factors associated with increased or decreased transmission of HIV, HBV, HCV

	Increased transmission	Decreased transmission
HIV	Any High viral load in index case	Any Low viral load (possibly through therapy) Post-exposure prophylaxis (antiretroviral therapy)
	Sexual Sexually transmitted infections in either partner Genital inflammation (includes STIs and non-infectious vaginal inflammation)	Sexual Condoms and safe sexual practices Treatment of sexually transmitted infections
	Occupational Deep penetrating injury Hollow-bore needle	Occupational Universal (standard) precautions
	Perinatal Vaginal delivery Breast-feeding	Perinatal Antiretroviral therapy Caesarean section Bottle-feeding
HBV	Any Unvaccinated status HBeAg+ or HBV DNA+ in index	Any Vaccination Post-exposure prophylaxis (immunoglobulin and vaccination)
HCV	Any HCV RNA+ index case High HCV viral load in index case	Any Negligible risk of transmission if source HCV RNA-negative Use of sterile, unused, injecting equipment in a safe environment

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