The incidence of sexually transmitted infections (STIs), which are a major cause of morbidity and mortality worldwide, is increasing. It is important to consider sexual health in all patients and to ask about sexual history in patients with risk factors for STIs. Patients frequently have >1 STI present; the diagnosis of a STI should prompt a search for others that may be asymptomatic. Partner notification is an important aspect of STI management, which may require referral to a specialist service.

**INTRODUCTION**

Sexually transmitted infections (STIs) present a major public health problem and are a major cause of acute illness, infertility, long-term disability and death worldwide. Early diagnosis and treatment of STIs can cure and prevent complications including pelvic inflammatory disease (PID), urethritis, infertility, arthritis and meningitis. The global incidence of STIs is rising since the 1990s the EU (including Ireland) has experienced significant increases in the incidence of STIs, especially genital chlamydia, gonorrhoea and syphilis. STIs are frequently asymptomatic and an additional concern is that there is increasing antimicrobial resistance to some STIs, in particular gonorrhoea. The increased incidence of STIs may reflect an increase in unsafe sexual behaviour, however it may also be due to increased testing, better diagnostics and more reporting. Sexual health is an important aspect to consider for all patients. In 2011, 11,000 cases of STIs were notified in Ireland, as follows: genital chlamydia (51%), ano-genital warts (16%), genital herpes simplex (9%), gonorrhoea (7%) syphilis (6%), trichomoniasis (0.5%) and non-specific urethritis (10%). HIV became a notifiable disease in September 2011. This bulletin will review the commonest notifiable STIs; a future bulletin will review the management of HIV.

**RISK FACTORS FOR STIs**

Certain patient groups are more at risk of acquiring a STI (see Table 1). A recent Irish study found that there was a lack of awareness amongst young people (17-34 years) of symptoms suggestive of STIs, and that there were significant levels of high risk behaviour. While young age is a risk factor, it is important to be aware that STIs are not only confined to young people. Healthcare professionals often do not discuss risky sexual behaviour and STI prevention with middle-aged and older adults.

Table 1: Risk factors for acquiring a STI

<table>
<thead>
<tr>
<th>Risk factor</th>
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<tr>
<td>Aged &lt;25 years</td>
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<tr>
<td>More than 2 sexual partners in the previous year</td>
</tr>
<tr>
<td>A previous STI</td>
</tr>
<tr>
<td>No/infrequent/inconsistent condom use</td>
</tr>
<tr>
<td>Living in an area of high STI prevalence (generally, urban areas)</td>
</tr>
<tr>
<td>Visiting an area of high STI prevalence (e.g. engaging in unprotected sex in certain overseas countries)</td>
</tr>
<tr>
<td>Men who have sex with other men</td>
</tr>
<tr>
<td>Certain minority ethnic groups</td>
</tr>
<tr>
<td>Those who buy or sell sex</td>
</tr>
<tr>
<td>The sexual partners of all of the above</td>
</tr>
</tbody>
</table>

**ASSESSMENT FOR STIs**

While many patients attend specialist STI clinics for testing, patients with STIs may also present to non-specialist settings and all clinicians should be aware of the appropriate management of a patient with a STI. Patients with STIs are also seen in primary care; services may range from testing and referring positive cases to specialist services, to managing uncomplicated cases depending on the clinical situation. Certain STIs (in particular syphilis) should be referred to a specialist setting. It is also important to note that partner notification is an important aspect of STI management; this may require referral of the patient to a specialist service, (which has a multidisciplinary structure).

A sexual health history should be incorporated into the evaluation of patients, as detailed in Table 2.

Table 2: Sexual history

<table>
<thead>
<tr>
<th>Symptom history</th>
<th>Medical history</th>
</tr>
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<tbody>
<tr>
<td><strong>Men</strong></td>
<td><strong>Women</strong></td>
</tr>
<tr>
<td>Urethritis can present with urethral discomfort/itch, dysuria, discharge, epididymo-orchitis, reactive arthritis, conjunctivitis (autoinoculation)</td>
<td>Pelvic inflammatory disease – as above plus ectopic pregnancy and infertility</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td><strong>Partner history</strong></td>
</tr>
<tr>
<td>Cervicitis can present with intermenstrual bleeding, post coital bleeding, deep dyspareunia, lower abdominal pain, ophthalmia neonatorum</td>
<td>When was the last sexual encounter?</td>
</tr>
<tr>
<td>Pelvic inflammatory disease – as above plus ectopic pregnancy and infertility</td>
<td>Who with? (traceable or not? male or female? overseas?)</td>
</tr>
<tr>
<td>Vaginal infections – vaginal discharge, itch, soreness</td>
<td>What sort of sex (oral, vaginal, anal?)</td>
</tr>
<tr>
<td></td>
<td>Were condoms used for all contacts?</td>
</tr>
<tr>
<td></td>
<td>Does the partner have a history of previous STIs and/or any symptoms?</td>
</tr>
<tr>
<td></td>
<td>How many partners over last 3 months?</td>
</tr>
</tbody>
</table>
Patients with STIs can present in a variety of ways; they may be symptomatic or asymptomatic presenting with an unrelated problem (belonging to a high risk group) or requesting to be tested for a STI. Contraceptive consultations provide an excellent opportunity to enquire about sexual health and to consider offering STI testing. **Taking a sexual history involves personal and sensitive issues that can cause stress to the patient, and requires a sensitive approach.**

**Examination** should include the genital area and the oral and perianal areas, as indicated by the patients’ history. For women with a suspected STI, a vaginal examination using a speculum should be undertaken (a self obtained vaginal swab can be used to test for chlamydia and gonorrhoea in asymptomatic women). Clinicians should consider the need for a chaperone during an intimate examination.

**Investigations** include testing for (1) chlamydia, gonorrhoea and trichomonas in patients with genital discharge, (2) syphilis and herpes in patients with genital ulcers and (3) chlamydia, gonorrhoea, syphilis, HIV and hepatitis B in asymptomatic patients with risk factors for STIs. Patients should be informed of the tests being undertaken. Nucleic acid amplification tests (NAATs) have been developed in recent years. These tests detect small amounts of the RNA and DNA of organisms and can be extremely sensitive and specific. Unlike culture methods they do not require organisms to remain viable, therefore urine samples or self-obtained swabs can be stored and transported to the laboratory at ambient temperatures. Contact should be made with the local laboratory to determine which tests are available and the transfer arrangements required.

**CHLAMYDIA TRACHOMATIS**

*Chlamydia trachomatis* (*C. trachomatis*) genital infection is the most common curable, bacterial STI worldwide. Irish figures, similar to other countries, report an overall prevalence of *C. trachomatis* in up to 5% of asymptomatic women and a higher prevalence (11%) in those aged <25 years. The clinical manifestations, diagnosis and treatment of uncomplicated infection are summarised in Table 3. There has been an increase in the number of reported cases of chlamydia in Ireland in recent years; risk factors for infection include age <25 years, new sexual partner or > one sexual partner in the last year, prior chlamydial infection and lack of consistent use of condoms.

Chlamydia is a major public health problem, which is frequently asymptomatic in men (50%) and women (70%); two thirds of sexual partners of chlamydia-positive individuals are also chlamydia positive. *C. trachomatis* is associated with pelvic inflammatory disease (PID) in up to 40% of infected untreated women, which can lead to ectopic pregnancy and tubal factor infertility. The risk of developing PID increases with each recurrence of infection. Other complications include neonatal transmission (neonatal conjunctivitis, pneumonia), epididymo-orchitis, and sexually acquired arthritis (more common in men); it also facilitates the transmission of HIV in both men and women.

Chlamydia screening programmes are in place in some countries, however evidence to support their effectiveness has been questioned. Results of a recent Irish study did not support the establishment of an opportunistic screening programme in Ireland. A test of cure is not routinely recommended but should be performed in pregnancy or if non-compliance or re-exposure is suspected.

**ANO-GENITAL WARTS**

Genital warts are caused by the human papilloma virus (HPV) of which there are >100 subtypes. The majority of HPV infections are asymptomatic or subclinical. The clinical manifestations, diagnosis and treatment of uncomplicated infection are summarised in Table 3. Studies suggest that up to 2% of the population up to 49 years have had genital warts. Most ano-genital warts are caused by non-oncogenic HPV types 6 and 11 (90%). However some lesions may contain oncogenic types associated with genital tract dysplasia and cancers (e.g. types 16 and 18). Those at risk of genital warts include young patients (highest incidence in 20-29 years), MSM and patients with HIV. Consistent use of condoms decreases the risk of genital warts by 70%. Recent evidence suggests that patients with genital warts have a long-term increased risk of ano-genital cancers and head and neck cancers.

Treatment of genital warts is encouraged as they are highly infectious, however a minority of cases resolve without treatment. All treatments have significant failure and relapse rates and may involve discomfort and local skin reactions. Podophyllotoxin and imiquimod are contra-indicated in pregnancy or lactation. Imiquimod is not recommended for urethral, intra-vaginal, cervical, rectal or intra-anal warts and/or in tissues with open wounds. Local skin reactions are common; imiquimod should be used with caution in patients with autoimmune conditions and in un-circumcised men with foreskin associated warts. The impact of the introduction of the HPV vaccination for adolescent girls on the incidence of ano-genital warts, cervical cancer, other lower ano-genital tract cancers and other HPV associated cancers is awaited.
GENITAL HERPES SIMPLEX

Genital herpes is equally likely to be caused by herpes simplex type 1 (HSV-1, the usual cause of oro-labial herpes) or herpes simplex virus type 2 (HSV-2, historically associated with sexual transmission). The majority of infections are acquired subclinically. Those at increased risk of infection include younger patients, MSM and patients with HIV. HSV is the most common STI in HIV patients. Following primary infection, the virus becomes latent in local sensory ganglia, periodically reactivating to cause symptomatic/asymptomatic lesions and infectious viral shedding. Genital infection with HSV-1 has a milder natural history than infection with HSV-2 and is associated with less frequent symptomatic recurrences and asymptomatic shedding. Condoms may be partially effective in preventing acquisition of HSV, especially in preventing transmission from infected males to their female sex partners.

The clinical manifestations, diagnosis and treatment of uncomplicated infection are summarised in Table 3. Many patients with symptomatic HSV may not have the classical lesions as described and serology may be helpful in situations including recurrent genital disease of unknown cause and investigating asymptomatic partners of patients with genital herpes, including pregnant women. Complications of HSV include autonomic neuropathy (resulting in urinary retention), autoinoculation to fingers and adjacent skin and aseptic meningitis. Recurrent HSV tends to be mild and self-limiting and management is on an individual basis. The patient may present with healing lesions and it may be appropriate to prescribe antiviral treatment (aciclovir or valaciclovir) for the next episode. The decision to start continuous suppressive therapy, which should be discontinued after a maximum of 12 months, needs to take into account the frequency of attacks (>6 attacks annually) and the costs and inconvenience of treatment.

While the risk of neonatal transmission is very low, pregnant women with a history of genital herpes should inform their obstetrician. Perinatal transmission, associated with disseminated HSV (which is rare) in the neonate, is most likely to occur following vaginal delivery after a first episode maternal genital HSV infection in the final trimester. The risk of neonatal transmission is much lower with recurrent HSV lesions or asymptomatic infection.

GONORRHOEA

Gonorrhoea is caused by the bacterium Neisseria gonorrhoeae, which represents 88 million of the estimated 448 million new cases of curable global STIs occurring annually. Although not as common as other STIs, there has been an increase in the incidence of gonorrhoea notified in Ireland in recent years. The prevalence of gonorrhoea is low in the general population but the risk is increased in MSM. The clinical manifestations, diagnosis and treatment of uncomplicated infection are summarised in Table 3. Frequently the infection is asymptomatic; asymptomatic carriers are more likely to transmit the infection than people with overt infections. Untreated or inadequately treated gonorrhoea results in complications including PID, epididymo-orchitis, prostatitis, arthritis, infertility and conjunctivitis. Patients with genital gonorrhoea are frequently co-infected with C. trachomatis (35% men and 41% women). Gonorrhoea is also known to facilitate the transmission of HIV infection. Currently of concern is the resistance of N. gonorrhoeae to third generation cephalosporins; emerging resistance have been reported in countries including the US, Australia, Norway and the UK. Referral to a specialist STI service should be considered for patients diagnosed with gonorrhoea and is recommended for patients with penicillin allergy for appropriate treatment, testing for other STIs and partner notification.

SYPHILIS

Syphilis is caused by the spirochete bacterium Treponema pallidum. It is a complicated infection and patients diagnosed with syphilis should be referred to a specialist service for management. Although less common than other STIs, similar to other developed countries, an increase of syphilis has been noted in recent years in Ireland. The highest rates of syphilis occur in MSM; an additional risk factor is HIV infection. Syphilis however may also occur in heterosexual men and in women. Syphilis has an incubation period of up to 90 days and is usually transmitted during sexual contact, however transmission may occur during pregnancy and via infected blood products. The clinical manifestations, diagnosis and treatment of syphilis are summarised in Table 3. Syphilis can be classified into early (primary, secondary and early latent <2 years of infection) and late (late latent >2 years of infection and tertiary). Syphilis is known as “the great pretender”; it can mimic many inflammatory conditions including uveitis. Syphilis (+/- HIV seroconversion) should be considered in MSM presenting with a rash and in all patients presenting with a genital ulcer. It is important to be aware of the signs and symptoms associated with syphilis; if left untreated, it can lead to serious sequelae including cardiovascular syphilis and neurosyphilis and during pregnancy, to conditions including polyhydramnios, miscarriage, premature labour and stillbirth. The immune response to syphilis involves production of antibodies to a broad range of antigens including specific [e.g. T. pallidum enzyme immunoassay (ELISA) for immunoglobulin (Ig) G or IgM, T. pallidum haemagglutination test (TPHA) and T. pallidum particle agglutination assay (TPPA)] and non-specific [e.g. rapid plasma reagin test (RPR)] treponemal antibodies. The first response to infection is the production of specific treponemal IgM (detected towards the end of the second week of infection) and IgG which appear by about 4 weeks. Interpretation of positive serology for syphilis requires specialist advice/refer a detailed history from the patient (including symptoms, treatment and previous test results). Positive tests should always be repeated on a second specimen to confirm the results while serology should be repeated a few weeks following a negative test if there is a high clinical suspicion of syphilis.

TRICHOMONIASIS

Trichomonos vaginalis is a flagellated protozoan which is found in the vagina, urethra and paraurethral glands in women (may be carried for months or years) and usually in the urethra in men. In adults transmission is almost exclusively sexually transmitted. There is evidence that trichomonos infection may enhance HIV transmission and there is concern that it may be associated with pregnancy complications. A test of cure is recommended in all cases.
Table 3: Clinical manifestations, testing and treatment of the common STIs

***Contact tracing is an important aspect in the management of STIs***

<table>
<thead>
<tr>
<th>STI</th>
<th>Clinical manifestations</th>
<th>Diagnosis</th>
<th>Treatment*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlamydia (Chlamydia trachomatis)</td>
<td>Females – (70% asymptomatic) post-coital (PCB) or intermenstrual bleeding (IMB), lower abdominal pain, purulent vaginal discharge, mucopurulent cervicitis +/- contact bleeding, dysuria. Males – (50% asymptomatic) urethral discharge, dysuria. Rectal: infections usually asymptomatic but may cause anal discharge and anorectal discomfort. Pharynx: infections are asymptomatic and uncommon.</td>
<td>NAAT ** of first void urine in men and women (patients should hold urine for at least one hour); a cervical swab or patient-taken vulvo-vaginal swab in women can also be used. Rectal +/- pharyngeal swabs if indicated.</td>
<td>Azithromycin 1 gram PO stat or doxycycline 100mg PO BD for 7 days (contraindicated in pregnancy). (Test of cure not routinely required)</td>
</tr>
<tr>
<td>Genital warts (20,3,38,40)</td>
<td>Human papilloma virus</td>
<td>Single or multiple warts in areas including the vulva, urethra, shaft of penis or scrotum, cervix, vagina, and perianal area. Warts on the moist non-hair bearing skin tend to be soft and non-keratinised and those on the dry hairy skin firm and keratinised.</td>
<td>Visual examination in most cases. Biopsy may be required for atypical or pigmented lesions to exclude neoplastic lesion especially in patients with HIV.</td>
</tr>
<tr>
<td>Genital herpes simplex type 1 and 2</td>
<td>Primary infection – (frequently asymptomatic), febrile illness 5-7 days, tingling/neuropathic pain in genital area, extensive bilateral crops of genital blisters, ulcers or fissures, lymphadenitis. Recurrent infection – usually self-limiting, unilateral ulcers (may be small and resemble non-specific erythema, erosions or fissures).</td>
<td>Swab from base of ulcer – for NAAT (preferred) or viral culture.</td>
<td>Primary infection oral anti viral drugs (aciclovir, valaciclovir and famciclovir) within 5 days of the start of the episode and while new lesions are forming; saline baths, analgesia (+/- topical lidocaine) prior to micturition. Hospitalisation may be required for complications including urinary retention and meningism. Recurrent infection – see text.</td>
</tr>
<tr>
<td>Gonorrhoea (Neisseria gonorrhoeae)</td>
<td>Females – (50% asymptomatic), vaginal discharge, lower abdominal pain/tenderness, dysuria, rarely IMB or PCB, mucopurulent cervicitis +/- contact bleeding. Males – (95% symptomatic), urethral discharge +/- dysuria within 2-5 days of exposure, mucopurulent discharge commonly, rarely epididymal tenderness or balanitis. Rectal infection (anai discharge 12%) and pharyngeal infection usually asymptomatic.</td>
<td>NAAT of endocervical, vaginal and urethral swabs (men and urine (men and women), rectal and pharyngeal swabs when indicated. Culture and sensitivity if possible recommended for positive NAATs prior to treatment.</td>
<td>Consider referral for specialist advice: Ceftriaxone 500mg IM stat plus azithromycin 1 gram po stat. (Test of cure recommended)</td>
</tr>
<tr>
<td>Syphilis (Treponema pallidum)</td>
<td>Primary infection [3-4 weeks] (1-90 days)] Painless chancre at the site of inoculation. Secondary [4-6 weeks (2-12 weeks)] includes rash (incl. extremitmes), mucous patches, condyloma lata, alopecia, systemic symptoms, diffuse lymphadenopathy, neurological abnormalities. Latent - asymptomatic, positive serology; early &lt; 2 years, relapse likely; late &gt;2 years, relapse improbable. Tertiary – [up to 30 years after exposure] spread of infection to other organs includes: neurosyphilis, cardiovascular syphilis and gummatous syphilis.</td>
<td>Diagnosis can be made by dark ground microscopy of lesions (only in specialist centres). Screen with serology e.g. T. pallidum specific EIA+ Positive results to be followed up with a different treponemal test.</td>
<td>Refer for specialist advice: Treatment involves multidisciplinary specialist management. Treatment decision should be made by a specialist in STI; the preferred treatment includes parenteral penicillin</td>
</tr>
<tr>
<td>Trichomoniasis (Trichomonas vaginalis)</td>
<td>Females – (50% asymptomatic) vaginal frothy discharge, vulval soreness, dysuria, vulvitis, vaginitis, “strawberry cervix” (2%). Males – (50% asymptomatic), urethral discharge +/- dysuria.</td>
<td>High vaginal swab (females) ** and urethral swab for males for direct microscopy, culture and sensitivity. First void urine (males) – culture.</td>
<td>Metronidazole 2g orally in a single dose or metronidazole 400mg BD for 5-7 days. (Test of cure recommended)</td>
</tr>
</tbody>
</table>

* - prescribers should refer to the Summary of Products Characteristics for full prescribing information; note that not all medicinal products are authorised for the indication; ** - nucleic acid amplification technique; # - enzyme immunoassay; ## - cervical cytology has high false positive (30%), need confirmation with culture from high vaginal swab

**SUMMARY**

It is important to consider the sexual health of all patients and the possibility of a patient having a STI, many of which are asymptomatic. Testing for STIs is recommended for symptomatic patients and asymptomatic patients who are at risk of a STI. Patients frequently have >1 STI present; the diagnosis of a STI should prompt a search for others that may be asymptomatic. A screen for STIs should include testing for chlamydia, gonorrhoea, syphilis, HIV and hepatitis B. Some patients with STIs (in particular syphilis) should be referred to a specialist setting. Partner notification is an important aspect of STI management. Medical practitioners are required to notify STIs to the Medical Officer of Health/Director of Public Health. Management should include preventive education including the importance of the use of condoms to prevent STIs and counselling as indicated. Patient information leaflets on STIs are available from the Health Protection Surveillance Centre (available on www.hpsc.ie).

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List of references available on request. Date of preparation: July 2012

Every effort has been made to ensure that this information is correct and is prepared from the best available resources at our disposal at the time of issue. Prescribers are recommended to refer to the individual Summary of Product Characteristics (SmPC) for specific information on a drug.
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