Laboratory update: Sexually transmitted infections

The term ‘sexually transmitted infections’ (STIs) is used to refer to various syndromes caused by pathogens acquired and transmitted by sexual activity. STIs are a major public health concern in South Africa and their impact is greatest in women, unborn children and neonates. They tend to cause acute illness and can develop complications such as infertility, ectopic pregnancies, upper genital tract infections and enhanced transmission and acquisition of HIV. Many of these pathogens can cause asymptomatic infection, particularly in women, which can nevertheless still be transmitted and result in complications, as listed above.

What are the common causes and their clinical presentations?

There are many different bacteria, viruses and parasites that can be transmitted sexually. The more common conditions encountered are gonorrhoea, chlamydial infection, syphilis, trichomoniasis, chancroid, genital herpes, genital warts, human immunodeficiency virus (HIV) infection and hepatitis B infection. STIs may present in several symptom-specific syndromes, including vaginal discharge, urethral discharge, genital ulceration, non-ulcerative genital disease and pelvic pain. It should also be remembered that STIs may also infect the rectum and throat, and infections at these sites are frequently asymptomatic. Some of these infections, such as Neisseria gonorrhoeae and Treponema pallidum (the organisms that cause gonorrhea and syphilis), can also cause disseminated infection and systemic disease.

Who should be screened for STIs?

Risk factors for STI acquisition include, among others, a young age (15-25 years), a new sexual partner, multiple sexual partners, prior history of an STI and illicit drug use. Any patient who presents with symptoms suggestive of a possible STI should be tested. The test requested depends on the clinical presentation and likely cause of the patient’s symptoms.

In addition, the Centres for Disease Control (CDC) recommends screening the following in risk patients for STIs:

- All patients being evaluated for STIs should be offered HIV counselling and testing.
- Hepatitis B screening should be offered to MSM (men who have sex with men), IV drug users, and persons with a history of multiple sexual partners. Non-immune persons should receive hepatitis B vaccination.
- MSM and IV drug users should be tested for hepatitis A immunity and vaccinated if non-immune.
- Asymptomatic women with risk factors for STIs should be screened annually for gonococcal or chlamydial infections by means of nucleic acid testing (PCR). Cervical cytology should also be performed (± HPV testing). HPV vaccination should be offered to young women between nine and 26 years of age.
- Sexually active MSM should be screened at least annually for HIV and syphilis by serological testing, and gonococcal and chlamydial infection by means of nucleic acid testing (PCR).
- Pregnant women should be screened for chlamydia (PCR), HIV, hepatitis B and syphilis.
- HIV-infected patients should be screened annually for chlamydia and gonorrhoea (PCR), and syphilis and hepatitis B.
- Partners of patients with STIs should be examined, tested and treated for the STI identified in the index patient.

What are the appropriate tests to request when screening for STIs?

STI tests can be done on either blood samples where appropriate or on samples collected from the site of the suspected infection. Nucleic acid amplification tests (PCR-based tests) are the tests of choice when screening for gonorrhoea and chlamydia on either first void urine samples or swabs collected from the site of the suspected infection or route of possible exposure if asymptomatic (urethra, cervix, rectum, pharynx). Antibody tests (ELISAs) for gonorrhoea and chlamydia are generally not recommended as they do not differentiate between the species that cause STIs and those that cause other infections, as well as not differentiating between recent and past exposures. The STIs for which serology may be used include HIV, hepatitis B virus and syphilis.
Below are the appropriate tests to request and sample types to collect when screening for the more common STIs.

Genital discharges (urethral, vaginal and related rectum and throat infections)
The pathogens most commonly associated with discharges are *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Nucleic acid tests (PCRs) are the assays of choice on either genital/rectal/throat swabs (depending on the site of infection) or urine samples for suspected urethritis or vaginal/cervical infection. The other pathogens which may cause genital tract discharges (*Mycoplasma genitalium*, *Trichomonas vaginalis* and *Ureaplasma urealyticum*) are also best detected using nucleic acid amplification techniques in the laboratory. While generally less sensitive, conventional microbiology techniques such as gram stain and culture of urethral swabs are useful in diagnosing and providing antibiotic susceptibilities for *N. gonorrhoeae*. A wet mount may also be useful in detecting *T. vaginalis* and the presence of bacterial vaginosis.

Genital ulceration (penile, scrotal, vaginal and vulval ulcers)
The pathogens most frequently associated with sexually transmitted genital ulcer disease are HSV and syphilis. PCR is the assay of choice for the diagnosis of HSV and should be performed on a swab taken from the lesion. Syphilis should be diagnosed with syphilis serology, which typically include non-treponemal tests such as the RPR and treponemal antibody tests such as an ELISA. Additional pathogens that may cause genital ulcer disease include distinct serovars of *Chlamydia trachomatis*, which causes lymphogranuloma venereum (LGV), *Haemophilus ducreyi*, which causes chancroid, and *Klebsiella granulomatis*, which causes granuloma inguinale. While a standard chlamydia PCR will detect the pathogen responsible for LGV, special requests need to be specified for the laboratory to detect *H. ducreyi* or *K. granulomatis*.

How do we treat the more common STIs?
In general in South Africa, STIs are managed syndromically without laboratory support. This is a pragmatic response due to the fact that laboratory testing can be time-consuming, thus delaying treatment in a patient. There is, however, evidence to show that specific laboratory diagnosis allows targeted treatment and the most appropriate use of antimicrobial drugs, and also facilitates reaching sexual contacts and offering them treatment. Cognisance should be taken of the recent evolution of quinolone resistance in *N. gonorrhoeae*, necessitating the move from quinolone to cephalosporin management with either Cefixime 400 mg PO stat or Ceftriaxone 250 mg IM stat.

What new STI test is Ampath offering?
Ampath is now offering a multiplex STI PCR that detects *N. gonorrhoeae*, *C. trachomatis*, *T. vaginalis*, *M. genitalium*, *M. hominis*, *U. urealyticum* and *U. parvum*. This test can be performed on either a dry swab from the suspected site of infection, first void urine samples, and on liquid-based cytology samples (SurePath or ThinPrep). This PCR is performed for the price of a single PCR, thus making this a very cost-effective laboratory test. When requesting this test, please write multiplex STI PCR or STD PCR in the block for “Other tests” on the request form.

Compiled by:
Dr Craig Corcoran, Clinical Virologist
Dr Terry Marshall, Clinical Virologist
Dr Charlotte Sriruttan, Clinical Microbiologist

Please contact your local pathologist for more information.