Sexually transmitted infections

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Sexually transmitted infections (STIs) other than HIV have reappeared as an important public health problem in developed countries (1). In the late 1970s and early 1980s, research and treatment of the 'classic' STIs – gonorrhea, syphilis and chlamydia – were a major focus of infectious diseases practice and research. There were large outbreaks of syphilis in parts of Canada (2), penicillin-resistant *Neisseria gonorrhoeae* was a concern (3), and high rates of *Chlamydia trachomatis* infection with complications of pelvic inflammatory disease and ectopic pregnancy were being reported (4,5). Then, HIV infection emerged, with its spectre of a wasting, early death. There was no effective treatment, and safe sexual practices were embraced and adhered to by high-risk populations as the only effective way to avoid infection. These practices effectively prevented other STIs; rates of syphilis, gonorrhea and chlamydia infection plummeted in developed countries (5). For at least a decade, it appeared that HIV might be an end to all STIs, at least for some parts of the world. STIs continued unabated in developing countries, as many epidemiological and therapeutic studies explored the association of STIs with HIV infection.

Optimism about the decline in STIs in North America is now over. Throughout Europe and North America, increasing rates of *Treponema pallidum* infection following reintroduction and failure of outbreak control have been reported (6). *N gonorrhoeae* infections are also increasing, although the current antimicrobial resistance of concern is ciprofloxacin resistance (7). *C trachomatis*, herpes simplex and papillomavirus infections are also common.

The burden of STIs is well described. A minority of individuals develop tertiary syphilis many years after initial infection. A few individuals with gonorrhea will develop disseminated infection, usually manifested as arthritis and/or dermatitis. Gonococcal endocarditis virtually disappeared with the antibiotic era, although case reports continue to appear; increasing resistance may lead to further cases of this dreaded complication (8). The major impacts of STIs, however, are in maternal and child health. Pelvic inflammatory disease is a common complication for young women with chlamydia or *N gonorrhoeae* infection, leading to infertility and ectopic pregnancy. Neonatal infection with herpes simplex or syphilis can be devastating. Human papillomavirus infection is the major cause of cervical malignancy in women. Infections and complications occur disproportionately in socially and economically disadvantaged groups. The additional burden of HIV infection amplifies morbidity.

Given the clear evidence that current practices are not effective, approaches to treatment and control of STIs must be re-evaluated. As with any infectious disease, a fundamental principle of effective management is accurate and timely diagnosis. This requires access to validated, standardized laboratory testing to identify the specific etiological agent (or agents, as is often the case with STIs). The goal of the Canadian STI Best Practice Laboratory Guidelines published in this and the upcoming issue of *The Canadian Journal of Infectious Diseases & Medical Microbiology* is to support programs for STI control and treatment through the promotion of access to and standardization of laboratory testing for these syndromes and agents. These documents have been developed by leading Canadian microbiology laboratorians with interest and expertise in STIs, and address the optimal diagnostic approach for specific infectious agents, infectious syndromes and asymptomatic populations. They are a resource for current practice and a foundation upon which future evolution in diagnostic strategies can develop.

Senior clinicians will be reassured in reviewing these guidelines to find that some diagnostic approaches have not changed substantially over the past 20 years. Interpretation and monitoring of syphilis serology remains the major diagnostic approach to this complex infection. A stained smear of urethral discharge to search for polymorphonuclear leukocytes and intracellular diplococci remains a foundation for the rapid diagnosis of acute urethritis in men. *C trachomatis* is still seldom grown in the clinical laboratory setting, and viral culture remains the gold standard for herpes simplex virus infection. But the transformations in microbiology laboratory diagnostics over the past 20 years, particularly in molecular technologies, are clearly apparent. Polymerase chain reaction and nucleic acid antigen testing are now widely used diagnostic tests, particularly for chlamydia and gonorrhea. This brings with it the concern that the failure to use culture methods for *N gonorrhoeae* will impair monitoring of resistance trends. Current diagnostic capabilities for papillomavirus are ahead of our clinical capabilities, as the ability to identify cancer-associated genotypes has not yet translated into meaningful clinical interventions for women without cervical lesions. The use of alternate body fluids, such as urine, for the diagnosis of specific infecting agents for urethritis is a step forward. The approach of self-collection of specimens by women is also promising. Rapid point-of-care testing is a recognized need, and tests are being aggressively developed and evaluated but remain impractical for most infectious agents in most settings.

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As these guidelines show, there is a substantial library of accurate, validated diagnostic methods to assist in improving the management of STIs. To address resurgent morbidity from STIs, accessible laboratory services and timely reporting are also essential. Ensuring that an appropriate laboratory service is provided falls to the Canadian microbiology laboratory network, primarily the provincial public health laboratories, although private laboratories also play a role in some provinces. The National Microbiology Laboratory (Winnipeg, Manitoba) within the new Canadian Public Health Agency is also a key player in test development, evaluation and standardization.

The provision of excellent laboratory service is only one component in addressing resurgent STIs. Clinicians play a major role in identifying clinical syndromes, making the decision to obtain a diagnostic test, and collecting and transporting appropriate specimens. Beyond the clinician and the laboratory, there must be an effective public health response to identify infected individuals, trace contacts and support prenatal screening and follow-up programs. STIs occur primarily in populations with well-recognized risk factors such as characteristics

of sexual activity, intravenous drug use and exploitation of women and girls. If the goals of STI control are to be achieved, effective programs for these groups need to be developed not just for STIs, but also for other infections and health issues. Interventions that effectively treat and prevent STIs will also support the control of HIV infection in these high-risk populations.

We have been involved in a national discussion to reshape and rebuild the Canadian public health system following the experience of the severe acute respiratory syndrome epidemic. There is optimism that the next five to 10 years will see the development of a public health system in Canada appropriate for the needs of Canadians and the role Canadians play internationally. One priority area for any public health system is maternal and child health, including the prevention of infections that compromise the delivery of excellent care. Many programs will compete for resources within the public health agenda, but addressing STIs must remain a priority. These guidelines, developed for Canadian laboratory practice, will assist in developing effective control programs and facilitate resource allocation decisions in providing these services.

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