

Laboratory Diagnosis of Sexually Transmitted Micro-organisms *Chlamydia trachomatis* and *Neisseria gonorrhoeae*



Chlamydia trachomatis and *Neisseria gonorrhoeae* (CT & NG) are recognized as two of the most prevalent sexually transmitted bacterial infections. Worldwide, there is an estimated annual incidence of 25 million of gonorrhea and 50 million of Chlamydia. In an effort to prevent the complication and spread of these diseases, increased attention is being focused on early diagnosis and treatment of symptomatic or asymptomatic infected individuals.

PATHOPHYSIOLOGY

Chlamydia have the ability to establish long-term associations with host cells. When an infected host cell is starved for various nutrients such as amino acids, iron, or vitamins, this has a negative consequence for *Chlamydia* since the organism is dependent on the host cell for these nutrients. Long-term cohort studies indicate that approximately 50% of those infected clear within a year, 80% within two years, and 90% within three years.

CLINICAL SIGNIFICANCE

C. trachomatis is an obligate intracellular pathogen (i.e. the bacterium lives within human cells) and can cause numerous disease states in both men and women. Both sexes can display urethritis, proctitis (rectal disease and bleeding), trachoma, and infertility. The bacterium can cause prostatitis and epididymitis in men. In women, cervicitis, pelvic inflammatory disease (PID), ectopic pregnancy, and acute or chronic pelvic pain are frequent complications. *C. trachomatis* is also an important neonatal pathogen, where it can lead to infections of the eye (trachoma) and pulmonary complications

COMPLICATIONS

In men, *C. trachomatis* causes 40-50% of cases of non-gonococcal urethritis, making it one of the most common sexually transmitted disease (STD) in heterosexual males. In women, Chlamydia, apart from causing urethritis is a major cause of pelvic inflammatory disease leading to infertility and ectopic pregnancy and can result in conjunctivitis and pneumonia in newborn infants exposed during passage through an infected individual, especially women, are asymptomatic. CT & NG infected, asymptomatic persons serve as a reservoir of infection, and since co-infection is common, symptoms may overlap, making clinical diagnosis difficult.

DIAGNOSIS

Conventional diagnosis of **CT** & **NG** infections require culture and microscopy. Microscopy is relatively inexpensive but sensitive is very low. Although sensitivity of culture is high but logistically complicated. This procedure requires careful specimen collection and stringent transport conditions and requires at least 48 to 72 hrs to perform. A pelvic examination is required for women and insertion of a urethral swab is required for men.

Screening for **CT** & **NG** infections can be performed on urine samples and genital swabs using molecular techniques. A novel approach has been developed that combined an automated extraction procedure, an automated liquid-handling system and Real Time PCR to detect **CT** & **NG** from urine or swabs.

COLLECTION OF SAMPLE FOR DIAGNOSIS OF CT/NG RT PCR

Specimen	Collection	Minimum volume	Storage	Transportation
Urine	Fast void urine	10ml	At 4°C	In cool gel pack box
Cervical/high Vaginal/ urethral swab/conjunctival scraping	Dacron swab transported as dry or mixed with normal saline	At 4°C	In cool gel pack box

Test Name	Report ready by
Real Time PCR for <i>Chlamydia trachomatis</i>	Monday & Thursday
Real Time PCR for <i>Neisseria gonorrhoeae</i>	

References :-

- Mania-Pramanik J et al. Current Chlamydia trachomatis Infection, A Major Cause of Infertility. J Reprod Infertil. 2012 Oct;13(4):204-10.
- Sandoz KM and Rockey DD. Antibiotic resistance in Chlamydiae. Future Microbiol. 2010 Sep;5(9):1427-42.