Genital chlamydial infection

Yoshiki Hiyama¹, Satoshi Takahashi², Mitsuru Yasuda³, Naoya Masumori¹

¹) Department of Urology, Sapporo Medical University School of Medicine.
²) Department of Infection Control and Laboratory Medicine, Sapporo Medical University School of Medicine.
³) Center for Nutrition Support and Infection Control, Gifu University Hospital

Epidemiology

Urogenital chlamydial infection caused is among the most common sexual transmitted infections. According to WHO, a total of 130 million cases of Chlamydial infection were reported worldwide in 2012. Rates of reported cases of chlamydial infection are highest among young people aged 15–24 years. In 2014, the rate among 15–19 years old was 1,804.0 cases per 100,000 and the rate among 20–24 years old was 2,484.6 cases per 100,000.

Clinical presentation

*Chlamydia trachomatis* causes trachoma, severe follicular conjunctivitis, can also infect columnar epithelial cells on urethra, uterus cervix, pharynx and rectum as well. Genital chlamydial infections include urethritis and acute epididymitis in men, and cervicitis and pelvic inflammatory disease in women. In addition, pharyngeal infection and proctitis can be also occurred as extra-genital chlamydial infection.

*C. trachomatis* generally infects through sexual intercourse. Genital chlamydial infection mainly causes slight specific subjective symptoms or lacks them. Therefore, the chance to visit clinics is easily lost, and genital chlamydial infection keep untreated and the source of infection.

In men, *C. trachomatis* generally account for about half of causative pathogen of non-gonococcal urethritis. In 20 to 30% of total cases with gonococcal urethritis, *C. trachomatis* also infect simultaneously.
In women, *C. trachomatis* has been the predominant pathogen of sexually transmitted infections worldwide. Genital chlamydial infection in women often causes the obstetric issue including infertility and miscarriage. Therefore, women with genital chlamydial infection are possible to be exposed to the threat of reproductive health.

**Diagnosis**

Microbiological diagnosis was done by using specimen of first void urine in men and cervical swab in women. Nucleic acid amplification tests (NAATs) including real time polymerase chain reaction (real time PCR), transcription mediated amplification (TMA), strand displacement amplification (SDA) and quenching probe polymerase chain reaction (QProbe PCR) are the most suitable examination to date, because of high sensitivity and specificity to detect *C. trachomatis*.

The downsides of NAATs are time and cost. Although NAATs based diagnostics often requires a second visit of patients, QProbe PCR of Toyobo and Xpert™ assay of Cepheid are the commercial rapid NAATs that could provide point-of-care testing of individual samples in approximately 90 min.

Enzyme immunoassay (EIA) test can be useful for the country impossible to put NAATs to practical use. EIA test is less sensitive to detect *C. trachomatis* than NAATs, however, EIA test is able to detect *C. trachomatis* if adequate elementary bodies exist in first void urine. In addition, there is useful EIA test that detect *C. trachomatis* within 30 minutes as valuable rapid diagnosis.

**Treatment**

Part of macrolide, fluoroquinolone and tetracycline show enough anti-chlamydial activity, and could be choose as standard treatment regimen. Penicillin, cephalosporin and aminoglycoside have less anti-chlamydial activity than the standard treatment regimen, therefore, those should not be determined as treatment regimen.

Due to the previous systematic review, azithromycin and doxycycline are appropriate as recommended treatment regimen. The other antimicrobial
agents, clarithromycin, levofloxacin, tosufloxacin, sitaflaxacin and minocycline are commonly appropriate as alternative treatment regimen.

Fortunately, there have been a few drug-resistant *C. trachomatis* strains reported from Europe and USA. To take possible resistant strains into consideration may be insignificant in clinical and practical situations.

Test of cure to detect therapeutic failure is considered 3-4 weeks after completing therapy. The post treatment infections do not result only from treatment failure but also from reinfection.

Management of asymptomatic men whose female sexual partner diagnosed as genital chlamydial infection

If asymptomatic men have pyuria, *C. trachomatis* is detected by NAATs in most men. If they do not have pyuria, *C. trachomatis* is detected in 20 to 30% of men. In principal, treatment should be done for men with positive *C. trachomatis*, however, to treat all men visiting clinic must be valid if the couple has the problem about violent and/or psychological discord.

Summary

- Treatment regimen
  - Recommended treatment regimen
    1. Azithromycin 1g once a day
    2. Azithromycin (extended release) 2g once a day
    3. Doxycycline 100mg twice a day for 7 days
  - Alternative treatment regimen
    1. Clarithromycin 200mg twice a day for 7 days
    2. Ofloxacin 200mg thrice a day for 7 days
    3. Levofloxacin 500mg once a day for 7 days
    4. Tosufloxacin 150mg twice a day for 7 days
    5. Sitafloxacin 100mg twice a day for 7 days
    6. Minocycline 100mg twice a day for 7 days
  - Epididymitis with high fever
Minocycline 100mg twice a day for 14 days

- **Diagnostic method**
  - Nucleic acid amplification test
    1. Transcription mediated amplification (Hologic)
    2. Strand displacement amplification (Becton Dickinson)
    3. Polymerase chain reaction and hybridisation (Greiner Bio-One)
    4. Real time polymerase chain reaction (Roche, Abbott, Seegene, Cepheid, Qiagen)
    5. Quenching probe polymerase chain reaction (Toyobo)

- **Enzyme immunoassay**