

IUSTI–E Scientific Advisory Council

Topic Report 2016 **Chlamydia**

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Advances in the field 2015-16

Report on recent developments on genital chlamydia infections

Angelika Stary

Recommendations for the laboratory-based detection of *C. trachomatis* are regularly renewed by the CDC, which provide an overview on available tests, an update on standard procedures for sampling and processing specimens, and advise for the interpretation of test results for laboratory reporting. Furthermore, European guidelines for the management of chlamydia infections have been established and published in 2016 by the International Union against Sexually Transmitted Infections (IUSTI) Europe. These are all regularly updated.

Indications for chlamydia testing remain extensive, not only including symptomatic patients, but also focussing on a large number of core group including persons diagnosed with other STIs and their sexual contacts, termination of pregnancy or any intrauterine intervention, and the large number of individuals with sexual risk behaviour, especially, those less than 25 years of age.

Nucleic acid amplification tests (NAATs), which identify chlamydia specific DNA or RNA, are the new gold standard for chlamydia diagnosis with superior sensitivity and specificity. Validated, quality-assured, and FDA-approved NAATs include Aptima assays, Abbott technologies, BD ProbeTec DNA assays, the Cobas technologies and Xpert assays, and are listed in the 2014 CDC MMWR recommendations, where there is also data summarized on evaluated specimen types and on transport and storage conditions. The sensitivity range of FDA-approved NAATs is >90%, and the specificity is usually >98%. However, it is important to consider, that all diagnostic NAATs can generate inaccurate results, with false positive or false negative results, mostly as a consequence of incorrect sampling, transport, and test procedure.

Rapid point of care tests (POCT) have been promoted in order to provide an easy and quick test result with immediate treatment recommendations. Few technologies are FDA-approved and sensitivities range between 25-65%. They may be cost-effective for those individuals who will not wait for longer than 40 minutes, which is a key element for the recommendation of a POCT, despite a lower sensitivity than NAATs. Considering the evaluation results when compared to FDA-approved NAATs, their recommendation is limited and there is still for improvement. “Assured” POCT have yet to become available.

The efficacy of azithromycin 1G single treatment compared with a seven day doxycycline therapy has been questioned. Several studies with different outcome are

chlamydia infections the difference of efficacy seems to be larger. A recent meta analysis of the efficacy infections showed a pooled efficacy of 82.9% for azithromycin and 99.6% for doxycycline for rectal chlamydia. These concerns are shared also by Schachter, who mentions several anecdotal reports of azithromycin being less effective than doxycycline for the treatment of rectal and oropharyngeal infections. He assumes that the biologic features of *C. trachomatis* infection and antibiotic levels may vary according to the anatomical site of infection. There remains a lack of hard data from trials of treatment of extragenital chlamydia infections.

Treatment of lymphogranuloma venereum serovar is recommended for 3 weeks with doxycycline 100mg twice daily. Hard data for azithromycin treatment for LGV is lacking. One has also to consider that coinfections with gonorrhoea, syphilis or *Mycoplasma genitalium* may occur in a high percentage, especially in men having sex with men, and treatment is therefore more complex. Since chlamydia typing is not available in many parts in Europe, treatment recommendations for rectal chlamydia infections should be adapted to cover possible infections with an LGV strain.

Chlamydia vaccines reports are emerging as a potential option for the prevention of chlamydia infections. A recent study on an intranasal chlamydia vaccine in mice was published in Science by G. Stary. He showed that mucosal immunization with UV-Ct complexed with charge-switching synthetic adjuvant particles (cSAPs) elicited long-lived protection in conventional and humanized mice. Regardless of vaccination route, UV-Ct-cSAP induced systemic memory T cells, but only mucosal vaccination induced effector T cells that rapidly seeded uterine mucosa with resident memory T cells (T(RM) cells). These data look promising for CT protection in a human study population, and further investigations are warranted.

5 Most Important Recent Publications

Kong FY, Tabrizi SN, Law M, Vodstrcil LA, Chen M, Fairley CK, Guy R, Bradshaw C, Hocking JS.

Azithromycin versus doxycycline for the treatment of genital chlamydia infection: a meta-analysis of randomised controlled trials.

Clinical Infectious Diseases 2014; 59(2): 193-205

Stary G, Olive A, Radovic-Moreno AF, Gondek D, Alvarez D, Basto PA, Perro M, Vrbancic VD, Tager AM, Shi J, Yethon JA, Farokhzad OC, Langer R, Starnbach MN, von Andrian UH.

VACCINES. A mucosal vaccine against *Chlamydia trachomatis* generates two waves of protective memory T cells.

Science. 2015 Jun 19;348(6241):aaa8205. doi: 10.1126/science.aaa8205.

Geisler WM, Uniyal A, Lee JY, Lensing SY, Johnson S, Perry RC, Kadrnka CM, Kerndt PR. Azithromycin versus doxycycline for urogenital *Chlamydia trachomatis* infection N Engl J Med 2015; 373: 2512-21

Quinn TC, Gaydos CA.

Treatment for chlamydia infection- doxycycline versus azithromycin.

N Engl J Med 2015; 373:2573-5

Chernesky M, Jang D, Gilchrist J, Randazzo J, Elit L, Lytwyn A, Smieja M, Reid J, Hill C. Ease and comfort of cervical and vaginal sampling for *Chlamydia trachomatis* and *Trichomonas vaginalis* with a new Aptima specimen collection and transportation kit. J Clin Microbiol 2014; 52:668-670.

Horner PJ, Wills GS, Reynolds R, Johnson AM, Muir DA, Winston A, Broadbent AJ, Parker D, McClure MO.

Effect of time since exposure to *Chlamydia trachomatis* on chlamydia antibody

Ms van Rooijen van der Loeff MF, Morré SA, van Dam AP, Speksnijder AG, de Vries HJ. Spontaneous pharyngeal Chlamydia trachomatis RNA clearance. A cross-sectional study followed by a cohort study of untreated STI clinic patients in Amsterdam, the Netherlands
Sex Transm Infect 2015; 91:157-164

Questions to be answered by future Research

Investigation of the immune response against Chlamydia: Vaccine Models
Acceptability of a Chlamydia vaccine
Tissue penetration of anti-chlamydia antimicrobials in extra-genital sites
Risk of induction of MDR M. genitalium by anti - Chlamydia therapy
Home testing for Chlamydia: what other diagnoses are missed

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Potential Speakers + Researchers

- 1. Henry JC de Vries**
STI clinic, cluster Infectious Diseases, Public Health Service Amsterdam
Topic: extragenital chlamydia infection
- 2. Magnus Unemo**
Treatment and resistance of C. trachomatis, Diagnosis
- 3. Georg Stary**
Topic: Immunology and vaccination of chlamydia infections
- 4. Jorma Paavonen**
Topic: chlamydia infections in women
- 5. Paddy Horner**
Topic: chlamydia infections in men
- 6. Ian Clark**
Topic: Basic research on chlamydia infections