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## A review on infection with *Chlamydia trachomatis*

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Infection with *Chlamydia trachomatis* accounts for the most common bacterial sexually transmitted infection in the UK. Men between 20 and 24 years and women between 16 and 19 years have the highest prevalence of chlamydial infection. Because the majority of women with chlamydial infection are asymptomatic, a proportion remains untreated and eventually develops pelvic inflammatory disease (PID). PID can result in ectopic pregnancy, infertility and chronic pelvic pain. Screening for chlamydial infection might reduce the incidence of complications of PID. The advent of nucleic acid amplification tests and single-dose therapy for chlamydial infection has made home testing and easy treatment possible.

**Key words:** chlamydia; diagnosis methods; nucleic acid amplification tests; screening; single-dose therapy.

### Questions and Literature Sources

#### Questions

- Population: women attending sexual health clinics
- Interventions: tests and treatments for Chlamydia; contact tracing
- Outcomes: accuracy of tests against suitable gold standards and cure rates, etc

#### Literature sources

- Electronic databases: MEDLINE, EMBASE, Cochrane Library, Best Evidence
- Manual search: personal files of articles available with authors, reference lists of all known primary and traditional review articles
- Contact with experts

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## INTRODUCTION

Infection with *Chlamydia trachomatis* accounts for the most common bacterial sexually transmitted infection in the UK. Untreated cases of chlamydial infection can lead to pelvic inflammatory disease (PID), ectopic pregnancy, infertility and chronic pelvic pain in women. Untreated chlamydial infection during labour can be vertically transmitted and cause conjunctivitis and pneumonia in infants. Untreated chlamydial infections in men can lead to epididymo-orchitis.

The economic impact of chlamydial infection on health service is enormous. In 1990, the total cost of treatment of chlamydial infection in the US was estimated to have exceeded \$4 billion.<sup>1</sup> The cost of the management of female complications of infection accounted for most of that bill.

Because of the impact of chlamydial infection on the health of young people, it is important to identify and treat infected patients and their partners. Although screening programmes managed by genitourinary medicine physicians are essential, it is important that gynaecologists, urologists and general practitioners to have sufficient knowledge and training to manage chlamydial infection and its complications.

## THE BIOVARS AND SEROVARS OF *CHLAMYDIA TRACHOMATIS*

Chlamydial species are Gram-negative, aerobic, obligate, intracellular pathogens. Because they are unable to synthesize their ATP, they have to use their host cell's energy resources. For this reason chlamydiae were once considered viruses. Of the three species of chlamydia, *Chlamydia trachomatis* and *C. pneumoniae* are known human pathogens. Genetic mapping of these two chlamydial species, has, however confirmed little similarity between the two species as 70 genes in *C. trachomatis* do not exist in *C. pneumoniae*.

*C. trachomatis* has several serovariants based on the features of their major membrane proteins. Serovars A, B and C cause trachoma. Serovars D to K infect ocular, genital and rectal columnar epithelial cells leading to conjunctivitis, urethritis, cervicitis and proctitis, respectively. These serovars also infect respiratory epithelial cells and cause infant pneumonia. Serovars L1–L3 cause lymphogranuloma venereum (LGV), a sexually transmitted infection (STI) that occurs mostly in tropical countries. In the UK, LGV mainly occurs in men who have sex with men (MSM).

## THE LIFE CYCLE OF *CHLAMYDIA TRACHOMATIS*

The chlamydial life cycle consists of two distinct phases. During the infectious phase outside its target cells, *C. trachomatis* forms elementary bodies that act like fungal spores and are responsible for transmission of infection. Chlamydia does not replicate in the form of elementary bodies. Inside its target cells, it forms the reticulate bodies that are capable of replication through binary fission. Reticulate bodies are not infectious.

Chlamydial elementary bodies infect non-ciliated columnar cells and macrophages. Once in contact with the surface of the host cell, chlamydia induces its own endocytosis. Inside the cell, the elementary bodies germinate and form the reticulate bodies that, after an incubation of 7–21 days, begin to replicate every 3 hours. The reticulate bodies so produced then convert into elementary bodies and shed off the cell membrane through exocytosis. It is thought that chlamydia's ability to survive phagocytosis and destruction by lysosomal enzymes is due to its unique cell-wall structure. This cell

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