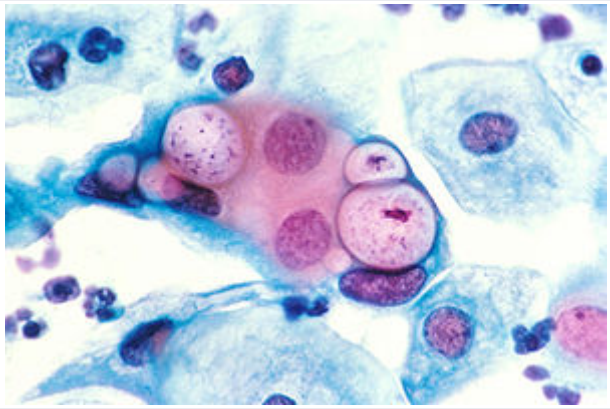
Chlamydia

Chlamydia, or more specifically a **chlamydia infection**, is a sexually transmitted infection caused by the bacterium *Chlamydia trachomatis*.[3] Most people who are infected have no symptoms.[1] When symptoms do develop this can take a few weeks following infection to occur.[1] Symptoms in women may include vaginal discharge or burning with urination.[1] Symptoms in men may include discharge from the penis, burning with urination, or pain and swelling of one or both testicles.[1] The infection can spread to the upper genital tract in women causing pelvic inflammatory disease which may result in future infertility or ectopic pregnancy.[2] Repeated infections of the eyes that go without treatment can result in trachoma, a common cause of blindness in the developing world.[7]

Chlamydia can be spread during vaginal, anal, or oral sex, and can be passed from an infected mother to her baby during childbirth.[1] The eye infections may also be spread by personal contact, flies, and contaminated towels in areas with poor sanitation.[7] *Chlamydia trachomatis* only occurs in humans.[8] Diagnosis is often by screening which is recommended yearly in sexually active women under the age of twenty-five, others at higher risk, and at the first prenatal visit.[1][2] Testing can be done on the urine or a swab of the cervix, vagina, or urethra.[2] Rectal or mouth swabs are required to diagnose infections in those areas.[2]

Prevention is by not having sex, the use of condoms, or having sex with only one other person, who is not infected.[1] Chlamydia can be cured by antibiotics with typically either azithromycin or doxycycline being used.[2] Erythromycin or azithromycin is recommended in babies and during pregnancy.[2] Sexual partners should also be treated and the infected people advised not to have sex for seven days and until symptom free.[2] Gonorrhea, syphilis, and HIV should be tested for in those who have been infected.[2] Following treatment people should be tested again after three months.[2]

Chlamydia	
Other names	Chlamydia infection
 Pap smear showing *C. trachomatis* (H&E stain)	
Pronunciation	/klə'mɪdiə/, *klə-MID-ee-yuh*
Specialty	Infectious disease, gynecology, urology
Symptoms	None, vaginal discharge, discharge from the penis, burning with urination[1]
Complications	Pain in the testicles, pelvic inflammatory disease, infertility, ectopic pregnancy[1][2]
Usual onset	Few weeks following exposure[1]
Causes	*Chlamydia trachomatis* spread by sexual intercourse or childbirth[3]
Diagnostic method	Urine or swab of the cervix, vagina, or urethra[2]
Prevention	Not having sex, condoms, sex with only one non–infected person[1]
Treatment	Antibiotics (azithromycin or doxycycline)[2]
Frequency	4.2% (women), 2.7% (men)[4][5]
Deaths	~200 (2015)[6]

Chlamydia is one of the most common sexually transmitted infections, affecting about 4.2% of women and 2.7% of men worldwide.[4][5] In 2015 about 61 million new cases occurred globally.[9] In the United States about 1.4 million cases were reported in 2014.[3] Infections are most common among those between the ages of 15 and 25 and are more common in women than men.[2][3] In 2015 infections resulted in about 200 deaths.[6] The word "chlamydia" is from the Greek, χλαμύδα meaning "cloak".[10][11]

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Signs and symptoms

Genital disease

Women

Chlamydial infection of the cervix (neck of the womb) is a sexually transmitted infection which has no symptoms for 50–70% of women infected. The infection can be passed through vaginal, anal, or oral sex. Of those who have an asymptomatic infection that is not detected by their doctor, approximately half will develop pelvic inflammatory disease (PID), a generic term for infection of the uterus, fallopian tubes, and/or ovaries. PID can cause scarring inside the reproductive organs, which can later cause serious complications, including chronic pelvic pain, difficulty becoming pregnant, ectopic (tubal) pregnancy, and other dangerous complications of pregnancy.

Inflammation of the cervix in a female from chlamydia infection characterized by mucopurulent cervical discharge, redness, and inflammation.

Chlamydia is known as the "silent epidemic", as in women it may not cause any symptoms in 70–80% of cases,[12] and can linger for months or years before being discovered. Signs and symptoms may include abnormal vaginal bleeding or discharge, abdominal pain, painful sexual intercourse, fever, painful urination or the urge to urinate more often than usual (urinary urgency).


Males may develop a white, cloudy or watery discharge (shown) from the tip of the penis.

For sexually active women who are not pregnant, screening is recommended in those under 25 and others at risk of infection.[13] Risk factors include a history of chlamydial or other sexually transmitted infection, new or multiple sexual partners, and inconsistent condom use.[14] Guidelines recommend all women attending for emergency contraceptive are offered Chlamydia testing, with studies showing up to 9% of women aged <25 years had Chlamydia.[15]

Men

In men, those with a chlamydial infection show symptoms of infectious inflammation of the urethra in about 50% of cases.[12] Symptoms that may occur include: a painful or burning sensation when urinating, an unusual discharge from the penis, testicular pain or swelling, or fever. If left untreated, chlamydia in men can spread to the testicles causing epididymitis, which in rare cases can lead to sterility if not treated.[12] Chlamydia is also a potential cause of prostatic inflammation in men, although the exact relevance in prostatitis is difficult to ascertain due to possible contamination from urethritis.[16]

Eye disease

Chlamydia conjunctivitis or trachoma was once the most important cause of blindness worldwide, but its role diminished from 15% of blindness cases by trachoma in 1995 to 3.6% in 2002.[17][18] The infection can be spread from eye to eye by fingers, shared towels or cloths, coughing and sneezing and eye-seeking flies.[19] Newborns can also develop chlamydia eye infection through childbirth (see below). Using the SAFE strategy (acronym for surgery for in-growing or in-turned lashes, antibiotics, facial cleanliness, and environmental improvements), the World Health Organization aims for the global elimination of trachoma by 2020 (GET 2020 initiative).[20][21]


Conjunctivitis due to chlamydia.

Joints

Chlamydia may also cause reactive arthritis—the triad of arthritis, conjunctivitis and urethral inflammation—especially in young men. About 15,000 men develop reactive arthritis due to chlamydia infection each year in the U.S., and about 5,000 are permanently affected by it. It can occur in both sexes, though is more common in men.

Infants

As many as half of all infants born to mothers with chlamydia will be born with the disease. Chlamydia can affect infants by causing spontaneous abortion; premature birth; conjunctivitis, which may lead to blindness; and pneumonia.[22] Conjunctivitis due to chlamydia typically occurs one week after birth (compared with chemical causes (within hours) or gonorrhea (2–5 days)).

Other conditions

A different serovar of Chlamydia trachomatis is also the cause of lymphogranuloma venereum, an infection of the lymph nodes and lymphatics. It usually presents with genital ulceration and swollen lymph nodes in the groin, but it may also manifest as rectal inflammation, fever or swollen lymph nodes in other regions of the body.[23]

Transmission

Chlamydia can be transmitted during vaginal, anal, or oral sex or direct contact with infected tissue such as conjunctiva. Chlamydia can also be passed from an infected mother to her baby during vaginal childbirth.[22]

Pathophysiology

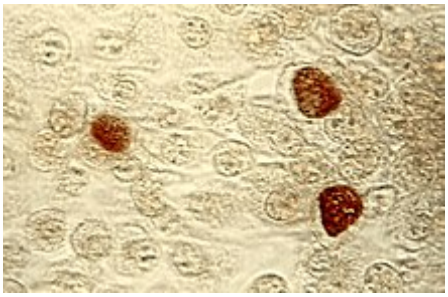
Chlamydiae have the ability to establish long-term associations with host cells. When an infected host cell is starved for various nutrients such as amino acids (for example, tryptophan),[24] iron, or vitamins, this has a negative consequence for *Chlamydiae* since the organism is dependent on the host 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.[25]

The starved chlamydiae enter a persistent growth state wherein they stop cell division and become morphologically aberrant by increasing in size.[26] Persistent organisms remain viable as they are capable of returning to a normal growth state once conditions in the host cell improve.

There is debate as to whether persistence has relevance. Some believe that persistent chlamydiae are the cause of chronic chlamydial diseases. Some antibiotics such as β-lactams have been found to induce a persistent-like growth state.[27][28]

Diagnosis

The diagnosis of genital chlamydial infections evolved rapidly from the 1990s through 2006. Nucleic acid amplification tests (NAAT), such as polymerase chain reaction (PCR), transcription mediated amplification (TMA), and the DNA strand displacement amplification (SDA) now are the mainstays. NAAT for chlamydia may be performed on swab specimens sampled from the cervix (women) or urethra (men), on self-collected vaginal swabs, or on voided urine.[29] NAAT has been estimated to have a sensitivity of approximately 90% and a specificity of approximately 99%, regardless of sampling from a cervical swab



Chlamydia trachomatis inclusion bodies (brown) in a McCoy cell culture.

or by urine specimen.[30] In women seeking an STI clinic and a urine test is negative, a subsequent cervical swab has been estimated to be positive in approximately 2% of the time.[30]

At present, the NAATs have regulatory approval only for testing urogenital specimens, although rapidly evolving research indicates that they may give reliable results on rectal specimens.

Because of improved test accuracy, ease of specimen management, convenience in specimen management, and ease of screening sexually active men and women, the NAATs have largely replaced culture, the historic gold standard for chlamydia diagnosis, and the non-amplified probe tests. The latter test is relatively insensitive, successfully detecting only 60–80% of infections in asymptomatic women, and often giving falsely positive results. Culture remains useful in selected circumstances and is currently the only assay approved for testing non-genital specimens. Other method also exist including: ligase chain reaction (LCR), direct fluorescent antibody resting, enzyme immunoassay, and cell culture.[31]

Prevention

Prevention is by not having sex, the use of condoms, or having sex with only one other person, who is not infected.[1]

Screening

For sexually active women who are not pregnant, screening is recommended in those under 25 and others at risk of infection.[13] Risk factors include a history of chlamydial or other sexually transmitted infection, new or multiple sexual partners, and inconsistent condom use.[14] For pregnant women, guidelines vary: screening women with age or other risk factors is recommended by the U.S. Preventive Services Task Force (USPSTF) (which recommends screening women under 25) and the American Academy of Family Physicians (which recommends screening women aged 25 or younger). The American College of Obstetricians and Gynecologists recommends screening all at risk, while the Centers for Disease Control and Prevention recommend universal screening of pregnant women.[13] The USPSTF acknowledges that in some communities there may be other risk factors for infection, such as ethnicity.[13] Evidence-based recommendations for screening initiation, intervals and termination are currently not possible.[13] For men, the USPSTF concludes evidence is currently insufficient to determine if regular screening of men for chlamydia is beneficial.[14] They recommend regular screening of men who are at increased risk for HIV or syphilis infection.[14] A Cochrane review found that the effects of screening are uncertain in terms of chlamydia transmission but that screening probably reduces the risk of pelvic inflammatory disease in women.[32]

In the United Kingdom the National Health Service (NHS) aims to:

1. Prevent and control chlamydia infection through early detection and treatment of asymptomatic infection;
2. Reduce onward transmission to sexual partners;
3. Prevent the consequences of untreated infection;
4. Test at least 25 percent of the sexually active under 25 population annually.[33]
5. Retest after treatment.[34]

Treatment

C. trachomatis infection can be effectively cured with antibiotics. Guidelines recommend azithromycin, doxycycline, erythromycin, levofloxacin or ofloxacin.[35] Agents recommended during pregnancy include erythromycin or amoxicillin.[2][36]

An option for treating sexual partners of those with chlamydia or gonorrhea includes patient-delivered partner therapy (PDT or PDPT), which is the practice of treating the sex partners of index cases by providing prescriptions or medications to the patient to take to his/her partner without the health care provider first examining the partner.[37]

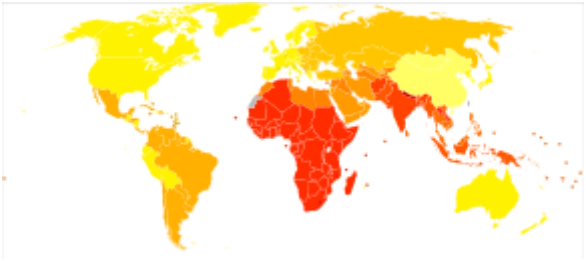
Following treatment people should be tested again after three months to check for reinfection.[2]

Epidemiology

Globally, as of 2015, sexually transmitted chlamydia affects approximately 61 million people.[9] It is more common in women (3.8%) than men (2.5%).[39] In 2015 it resulted in about 200 deaths.[6]

In the United States about 1.6 million cases were reported in 2016.[40] The CDC estimates that if one includes unreported cases there are about 2.9 million each year.[40] It affects around 2% of young people.[41] Chlamydial infection is the most common bacterial sexually transmitted infection in the UK.[42]

Chlamydia causes more than 250,000 cases of epididymitis in the U.S. each year. Chlamydia causes 250,000 to 500,000 cases of PID every year in the United States. Women infected with chlamydia are up to five times more likely to become infected with HIV, if exposed.[22]



Disability-adjusted life year (DALY) for chlamydia per 100,000 inhabitants in 2004.[38]

- no data
- ≤10
- 10–20
- 20–30
- 30–40
- 40–50
- 50–60
- 60–70
- 70–80
- 80–90
- 90–100
- 100–110
- more than 110

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External links

- Chlamydia (https://curlie.org/Health/Reproductive_Health/Sexually_Transmitted_Diseases/Chlamydia/) at Curlie
- Chlamydia Fact Sheet (https://www.cdc.gov/std/Chlamydia/STDFact-Chlamydia.htm) from the CDC

Classification	**ICD-10**: A55 (http://apps.who.int/classifications/icd10/browse/2016/en#/A5 D

- Links to chlamydia pictures (http://hardinmd.lib.uiowa.edu/chlamydiapictures.html) at University of Iowa

	5), A56 (http://apps.who.int/classifications/icd10/browse/2016/en#/A56), A70-A74 (http://apps.who.int/classifications/icd10/browse/2016/en#/A70-A74) · **ICD-9-CM**: 099.41 (http://www.icd9data.com/getICD9Code.ashx?icd9=099.41), 483.1 (http://www.icd9data.com/getICD9Code.ashx?icd9=483.1) · **MeSH**: D002690 (https://www.nlm.nih.gov/cgi/mesh/2015/MB_cgi?field=uid&term=D002690) · **DiseasesDB**: 2384 (http://www.diseasesdatabase.com/ddb2384.htm)
External resources	**eMedicine**: med/340 (https://emedicine.medscape.com/med/340-overview)

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