

Neonatal conjunctivitis and pneumonia due to chlamydia infection

Genital chlamydia infection is the most commonly reported sexually transmitted infection in young adults and teenagers in the United Kingdom, particularly affecting those having unsafe sexual intercourse with multiple sexual partners. Infants born to women with untreated infection are at risk of chlamydial conjunctivitis and pneumonia. The prevalence, consequences, prevention and treatment of chlamydia infection and disease in both women and infants are described.

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Key points

- Pellowe, C., Pratt, R.J.** (2006) Neonatal conjunctivitis and pneumonia due to chlamydia infection. *Infant* 2(1): 16-17.
1. Genital *Chlamydia trachomatis* is the commonest STI in the United Kingdom, with 104,155 diagnoses in GUM clinics in 2004.
 2. About 75% of women and 50% of men with chlamydia have no symptoms of infection.
 3. In women, untreated genital chlamydia infection can spread into the pelvic area and infect the uterus, fallopian tubes, and ovaries, leading to pelvic inflammatory disease.
 4. Chlamydia infection can cause early labour and delivery and can be transmitted from mother to baby during birth.
 5. Chlamydia infection in newborns can cause neonatal conjunctivitis and pneumonia.

Chlamydiae are small Gram-negative bacteria, which like viruses, can only replicate inside cells, i.e. they are obligate intracellular parasites. However, unlike viruses, they are genuine cells being composed of both DNA and RNA, ribosomes and a cell wall, and dividing by binary fission. Yet, in contrast to most bacterial cells, chlamydiae lack the cellular chemistry to produce their own energy and must invade and use a host cell to reproduce. There are several different types (species) of chlamydiae, including *Chlamydia trachomatis*, a common cause of sexually transmitted inflammatory genital disease, such as urethritis, cervicitis and vaginitis. Infected women frequently transmit *C. trachomatis* infection to their infants during birth.

Prevalence

Genital chlamydia is the most common sexually transmitted infection seen in genitourinary medicine (GUM) clinics in England¹. People most at risk are those having unprotected sexual intercourse, particularly those with multiple sexual partners. In 2004, a total of 103,932 infections were diagnosed in GUM clinics, representing an 8% increase compared with 2003, and for the first time, women aged 16-24 years exceeded 1000 cases per 100,000². However, these cases only account for people diagnosed in GUM services and the national prevalence of genital chlamydia infection is unknown, but is clearly well in excess of those diagnosed in GUM services.

Four year ago, The National Strategy for HIV and Sexual Health³ outlined the Department of Health's commitment to a national chlamydia screening programme

which commenced in 10 areas of England in September 2002. A further 16 areas were added in January 2004, covering 25% of all primary care trusts in England, and all areas will be included in the national screening programme by 2008. The focus of this programme is an opportunistic screening of asymptomatic men and women aged 16-24 years of age attending a variety of healthcare settings, for example general practices, contraceptive clinics and young people's services⁴. The screening method is simple and involves the collection of urine samples and self-collected vulvo-vaginal swabs for diagnosis.

Data from the first year of screening shows a prevalence rate of 10.1% in women, over half of whom were under 20 years old⁴. Although this rate is less than that seen in GUM clinics, it demonstrates a significant prevalence among sexually active people. As women are not offered screening for chlamydia infection during antenatal care, it is highly likely that many infected women will be undiagnosed during pregnancy.

Consequences of chlamydia infection

In addition to inflammatory genital disease, the health consequences of *C. trachomatis* infection can be serious. Infected women may develop an ascending infection that can cause pelvic inflammatory disease, infertility due to damaged fallopian tubes and ectopic pregnancy⁵. Infected pregnant women are at increased risk of premature labour, premature rupture of membranes, low birthweight infants and still births⁵.

Vaginal delivery is the usual route of transmission of *C. trachomatis* from



FIGURE 1 Chlamydia infection can be transmitted from infected mothers to their babies during birth.

infected mother to infant, as the eyes are coated with chlamydia as the baby passes down the birth canal (**FIGURE 1**). Approximately 50-70% of infants born to women with genital chlamydia infection will acquire chlamydia infection if no prophylaxis is given before or immediately after birth⁶.

Neonatal chlamydia infection

Infants who become infected with chlamydia during birth frequently develop a type of neonatal conjunctivitis of the eyes, sometimes referred to as *Ophthalmia Neonatorum*. Maternally-acquired infection with *C. trachomatis* is the commonest cause of neonatal conjunctivitis in industrially developed countries and it is a significant cause of this condition in the developing world⁶. Conjunctivitis develops between 5-14 days after delivery, usually in one eye but affecting the other after 2-7 days. Oedema and erythema of the eyelids is common, along with an eye discharge that may be watery initially, but becoming purulent later⁶. Although chlamydia conjunctivitis is usually mild, infection of the hair follicles will increase the amount of discharge and prolong the period of infection⁶. A less frequent cause of neonatal conjunctivitis in England is maternally-acquired gonococcal infection.

The most serious complication of

neonatal chlamydia infection is pneumonia caused by nasopharyngeal *C. trachomatis* infection or aspiration of infected genital secretions during delivery. Pneumonia, affecting as many as 10-20 percent of all infected infants, typically occurs at around six weeks of age, although reports range from 1-19 weeks⁶. These babies generally have a low-grade fever with an increased respiratory rate. Often a persistent cough interferes with feeding. A chest X-ray will show hyperinflation and diffuse infiltrates⁶. Pneumonia in

pre-term babies is more serious, presenting initially with respiratory distress followed by worsening respiratory signs and apnoea⁶. If left untreated, infants are at increased risk of developing chronic pulmonary disease, including asthma⁶. Another species of chlamydia that also causes pneumonia in new-born infants is *Chlamydia pneumoniae*.

Treatment

A variety of antimicrobial drugs can be used to effectively treat genital chlamydia infection in adults, including azithromycin, doxycycline, erythromycin and amoxicillin. In order to prevent re-infection, current sexual partners should also be screened and, if found infected, treated⁷.

In infants with chlamydia conjunctivitis or chlamydia pneumonia, systemic therapy with erythromycin is prescribed⁶. Erythromycin is generally well tolerated, although it has been associated with the development of hypertrophic pyloric stenosis⁶. Follow-up should be carried out in all treated infants as subsequent courses of therapy may be required⁶.

Preventing neonatal conjunctivitis

Conjunctivitis can be prevented in neonates by the topical use of various antimicrobial ophthalmic ointments or eye drops. In areas where there is a high incidence of gonococcal infection, or where prenatal screening for chlamydia is unavailable, prophylaxis is an option. However, an effective prophylactic agent would need to be primarily active against *Neisseria gonorrhoeae*, as this does the most

damage to neonate's vision. In the industrially developing world, 1% silver nitrate solution has been used but this is less effective in preventing conjunctivitis caused by *C. trachomatis*⁶.

During antenatal care in England, pregnant women are routinely screened for gonorrhoea and the incidence is low. A number of studies concentrating on prophylactic agents against chlamydia conjunctivitis comparing the topical use of erythromycin, tetracycline and silver nitrate solutions have proved inconclusive⁶. Povidone-iodine eye drops have been reported to have a broader spectrum of activity with less side effects and no bacterial resistance, and in resource-poor countries, also have the advantage of being cheaper to produce⁶.

An alternative option is to give systematic prophylaxis to all pregnant women. This has proved cost effective in countries with prevalence rates of chlamydia greater than 3%⁶. As the UK prevalence is far less than this, it is not current practice.

Conclusions

Chlamydial infection is a major cause of neonatal conjunctivitis in both developed and developing countries. A national screening programme in England will not be fully operational until 2008 and, even when established, pregnant women may still present with undiagnosed infection. Neonatal nurses will need to be aware of the possibility of chlamydia as the cause of conjunctivitis and pneumonia, as early treatment rather than prophylaxis remains the best strategy.

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