

Gonorrhoea

Jackie Sherrard

Abstract

Gonorrhoea is the second most common bacterial sexually transmitted infection (STI) in the UK. The main risk groups in the UK include men who have sex with men (MSM) and black ethnic populations. The symptoms and signs depend on the site of infection. Both local and disseminated complications may occur. The diagnosis is established by the identification of *Neisseria gonorrhoeae* at an infected site either by culture or nucleic acid amplification tests. These are more expensive than culture and lack the advantage of enabling antibiotic sensitivity testing, and there are some false-positive results. The aims of treatment are to eliminate the organism from all sites of infection, and to minimize the risk of complications and the potential for ongoing transmission. The antibiotic chosen should be guided by known local sensitivities of gonococci. In recent years gonococcal antibiotic resistance has become a worldwide problem and providing effective therapy is becoming a challenge. In some countries, the gonococcus no longer responds reliably to available antibiotics. Continued surveillance is essential to identify drift or emergence of resistance to the currently effective agents. Coexistent STIs should be sought and treated with appropriate medication. It is essential that all recent and current sexual partners are seen and tested for gonorrhoea and other STIs.

Keywords antibiotic resistance; cervicitis; disseminated gonococcal infection; gonorrhoea; *Neisseria gonorrhoeae*; ophthalmia neonatorum; urethritis

About 62 million cases of gonorrhoea are diagnosed each year worldwide. It is the second most common bacterial sexually transmitted infection (STI) in the UK, with a total of 18 710 uncomplicated infections diagnosed in GUM clinics in 2007 although rates have been falling since 2002. The main risk groups in the UK are men who have sex with men (MSM), who accounted for 30% of diagnoses in men in 2007, and black ethnic populations.

The causative organism, *Neisseria gonorrhoeae*, is a Gram-negative diplococcus that infects the mucosal surfaces of the genital tract, including the urethra in both men and women, the genital glands (e.g. Skene's and Bartholin's glands in women, Cowper's and Tyson's glands in men), the uterine cervix and fallopian tubes, and the epididymides. It can also infect the anal canal and distal rectum, the oropharynx and the eye. *N. gonorrhoeae* is a delicate organism; it survives poorly out of the body, does not survive drying, and is fastidious in its growth requirements.

Transmission

Gonorrhoea is always sexually transmitted in adults. Transmission is more efficient from males to females. The risk of

acquisition from a single act of sexual intercourse with an infected partner is estimated at 30–70%. Vertical transmission also occurs. About 30% of babies born to infected mothers develop ophthalmia neonatorum, typically presenting in the first week after birth. Neonatal sepsis may occur, particularly when there has been prolonged rupture of membranes or preterm delivery. An expert should investigate gonorrhoea in infants and children, and the relevant authorities must be involved because of the possibility of sexual abuse (see pages 231–234).

Clinical features

The symptoms and signs of gonorrhoea depend on the site of infection. The sites at which positive cultures are found depend on the sexual lifestyle of the patient.

Men with urethral infection usually develop symptoms (most commonly discharge or discharge with dysuria) 3–10 days after exposure. This period is longer in up to 15% of patients, and some men remain asymptomatic. Untreated, symptoms resolve in most cases (95% by 6 months before the advent of effective antibiotic therapy), but these men can remain infectious for many months.

Cervical infection in women is asymptomatic in about 70% of episodes. The symptoms that do occur (e.g. vaginal discharge, low abdominal or pelvic pain) are nonspecific.

Rectal infection may cause rectal/anal pain or discharge, but is more often asymptomatic. In women, rectal infection can occur in the absence of anal intercourse. Pharyngeal infection is usually asymptomatic, but pharyngitis may develop.

Examination may be normal. The signs observed depend on the site of infection. In men, the most common finding is urethral discharge (Figure 1), which may vary from scant and mucoid to copious and purulent. In women, the most common signs are mucopurulent cervicitis and vaginal discharge, which may be caused by concomitant pathogens. The discharge of gonorrhoea has no pathognomonic features. In both sexes, signs of local complications may be present (see below).

Diagnosis

The diagnosis is established by the identification of *N. gonorrhoeae* at an infected site. Culture offers a specific, sensitive and



Figure 1 Urethral discharge of gonorrhoea.

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cheap diagnostic test that readily allows confirmatory identification and provides information on antimicrobial sensitivities. It is currently the method of first choice for use in genitourinary medicine clinics in the UK.

Up to 98% of symptomatic urethral infections in men are diagnosed by the finding of Gram-negative intracellular diplococci on a Gram-stained smear from the urethra, but only 50–70% of asymptomatic infections. Microscopy of specimens from the cervix and rectum is less reliable (40–50%), and microscopy of oropharyngeal specimens is unhelpful.

Newer diagnostic tests based on nucleic acid amplification (NAATs) are available. These have high specificity and sensitivity, and enable noninvasive sampling. They are, however, more expensive than culture and lack the advantage of enabling antibiotic sensitivity testing, and there are some false positive results. Confirmation of a NAAT-positive result by culture is advisable. There are currently no NAATs that are licensed for use with rectal or pharyngeal samples.

Specimen collection

Men: routinely from the urethra, and in MSM rectal samples should be obtained if there is a history of oro-anal or anogenital contact, ideally under direct vision of the rectal mucosa (i.e. using a proctoscope). The oropharynx should be sampled in all gonorrhoea contacts and in homosexual men. A first passed urine sample provides an alternative urethral specimen for testing with a NAAT.

Women: sample routinely from the endocervix and urethra, take rectal and oropharyngeal tests when symptomatic at these sites or when a sexual partner has gonorrhoea and when indicated by the sexual history. A self-taken vaginal swab provides a suitable alternative specimen for screening tests using a NAAT.

Samples should be taken on two occasions in high-risk patients (i.e. known or suspected contacts) before a diagnosis of gonorrhoea is excluded, unless epidemiological treatment with effective antimicrobial therapy is given.

Complications

Complications of gonorrhoea are usually seen when untreated infection has been present for a prolonged period, and are more common in settings where access to medical care is difficult. In the UK, complications occur in about 3% of cases in females and less than 1% in males. Both local and disseminated complications may occur (Table 1).

Local complications

In the UK, the most common local complications are salpingitis in females and, less commonly, epididymitis in males. Infections of the urethral, para-urethral or other glands in the genital area may be seen in both men and women. Penile oedema and penile lymphangitis are uncommon minor complications of urethral infection in men, and resolve following appropriate antibiotic therapy.

Disseminated gonococcal infection

Disseminated infection seldom presents to genitourinary medicine clinics because of the lack of genital symptoms and the presence of either skin lesions and/or arthritis (Figures 2 and 3).

Complications of gonorrhoea

Local complications in men

- Para-urethral duct infection
- Tysonitis (infection of sebaceous glands)
- Periurethral abscess
- Epididymitis
- Penile oedema
- Penile lymphangitis

Local complications in women

- Bartholinitis
- Skenitis (para-urethral gland infection)
- Endometritis
- Salpingitis, which may lead to peritonitis and tubo-ovarian abscesses
- Perihepatitis

In both sexes

- HIV transmission is facilitated

Less commonly, disseminated infection occurs by haematogenous spread

- Septicaemia
- Arthritis
- Dermatitis
- Endocarditis
- Meningitis

Table 1

The skin lesions are most commonly seen on distal extremities and begin as papules or petechiae before evolving into micro-septic pustular infarcts. There are seldom more than five or six lesions. The arthritis is typically polyarticular arthritis or tenosynovitis, most commonly involving the knees, wrists, small joints of the hands, ankles and elbows. Endocarditis and meningitis have become very rare and are seen most often in individuals with a deficiency in one of the components of the complement pathway.

A full set of genital tests is advised in patients with suspected disseminated infection. The diagnosis may be made on blood culture or culture of joint aspirate, but both lack sensitivity compared with genital sampling in patients with disseminated infection. It must be remembered that these patients have an STI. They should be advised accordingly, and their sexual contacts sought and investigated.



Figure 2 Skin lesions of disseminated gonorrhoea.

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