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JOSEPHINE G PATERSON

Diagnosis, treatment and prevention of gonorrhoea


Abstract

Neisseria gonorrhoeae is a Gram-negative bacteria responsible for the sexually transmitted infection gonorrhoea, which is increasingly common in the UK. Drug-resistant strains of the bacteria have emerged, which is making gonorrhoea difficult to treat. Therefore, preventing infection is important. This article identifies people at increased risk of contracting the infection, and explores how nurses can offer testing and treatment as well as helping to prevent infection through education and health promotion.

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GONORRHOEA IS A sexually transmitted infection (STI) caused by Neisseria gonorrhoeae, and is acquired through oral, vaginal or anal sex. According to Public Health England (PHE) (2013), gonorrhoea is the second most common bacterial STI in England, with the rate of infection increasing among men and women by 25% from 2010 to 2011 (PHE 2012) and a further increase of 21% from 2011 to 2012 (PHE 2013). Gonorrhoea remains a treatable infection, however drug-resistant strains of N. gonorrhoeae are emerging, which is making the infection increasingly difficult to manage and treat.

Aetiology

The sites of primary infection and colonisation by N. gonorrhoeae are the endocervix, urethra, anus, pharynx and conjunctiva (Richens 2011). It is important to note that many individuals, and particularly women, with gonorrhoea are asymptomatic. More than 50% of women subsequently diagnosed with gonorrhoea have no clinical signs or symptoms, therefore screening those at risk is crucial to help prevent the spread of infection (Health Protection Agency (HPA) 2010). Unless in the incubation period of the disease, men usually experience symptoms of dysuria and urethral discharge (Peterson et al 2006). Less than 10% of men with gonorrhoeal infection of the urethra will be asymptomatic. Men and women with gonorrhoeal infection of the rectum and pharynx will also usually be asymptomatic (British Association for Sexual Health and HIV (BASHH) 2012). Although people with gonorrhoea may be asymptomatic, they can still transmit the infection to others.
N. gonorrhoeae infections are often treated empirically, that is, based on the sexual risk identified regardless of first-line screening available in most sexual health clinics. All individuals will be offered screening for each potential site exposed (HPA 2013).

Persistent N. gonorrhoeae infection can lead to ongoing illness and complications. In women, it may result in pelvic inflammatory disease, infertility and ectopic pregnancy. In men, it may lead to prostatitis and epididymitis (Fenton and Rogstad 2011). Patients diagnosed with gonorrhoea may have concomitant STI. The most common co-infection is chlamydia, with rates ranging from 21-36% in patients of all sexualities (HPA 2011). In addition, there is an increased risk of human immunodeficiency virus (HIV) transmission or infection in individuals with a STI because the presence of a co-infection, such as gonorrhoea or chlamydia, has been shown to contribute to shedding of the virus in people known to be HIV-positive at the site of infection (Fleming and Wasserheit 1999). These infections can also make the mucosal tissue of the infected individual more susceptible to HIV infection (Fleming and Wasserheit 1999, Ethier et al 2003). An understanding of these processes gives further impetus for timely diagnosis and treatment of gonorrhoea, particularly in young heterosexuals who may engage in behaviour that increases their risk of HIV infection (Le Polain De Waroux et al 2014).

**Epidemiology**

The number of N. gonorrhoeae infections in England and Wales has varied between different population groups in recent years, although the overall rate of diagnoses is increasing (HPA 2012). This is also the case for N. gonorrhoeae infections in Scotland, where an increase of 12% was seen between 2010 and 2011 (Health Protection Scotland (HPS) 2013). Trends in N. gonorrhoeae infection according to sex and sexuality, age, ethnicity, socioeconomic status and geographical location are considered. Engaging in repeated unprotected sex with casual partners, sex under the influence of alcohol and drugs, and poor access to healthcare services are risk factors for N. gonorrhoeae infection.

**Sex and sexuality**

The largest percentage of N. gonorrhoeae infections in England is found in men who have sex with men (MSM), accounting for 39% of diagnoses, while heterosexual men and women have similar infection rates of 30% and 31%, respectively (HPA 2012). The number of N. gonorrhoeae infections diagnosed in MSM in England rose by 61% between 2010 and 2011 (HPA 2012). These figures are of concern when considered alongside the potential increased risk of HIV transmission in individuals with STIs, particularly because MSM are already at increased risk of contracting HIV (PHE 2013).

**Age**

In heterosexuals, 57% of N. gonorrhoeae infections in England in 2011 were diagnosed in young people between the ages of 15 and 24; with the highest rates in women peaking at a younger age than men (HPA 2012). This finding was not repeated in MSM, where only 24% of diagnoses involved those aged between 15 and 24, while 47% of diagnoses were made in men aged between 25 and 34 (HPA 2012). Similarly, in Scotland, the highest rates of N. gonorrhoeae infections are in people of all sexuality under the age of 25 (HPS 2013).

**Ethnicity, socioeconomic status and geographical location**

People of black or black British ethnicity are the largest ethnic group diagnosed with N. gonorrhoeae (HPA 2012). Generally, higher rates of N. gonorrhoeae infection are found in urban areas associated with large cities such as London and Manchester than are generally seen across the UK. This finding can also be linked to data that suggest that infection rates are highest in people of lower socioeconomic status (HPA 2012) since health inequalities affect access to sexual health services in much the same way as general poor health outcomes in this group of people.

**Symptoms**

Men with gonorrhoea may experience purulent urethral discharge and dysuria following an incubation period of two to five days (Hook and Hunter Handsfield 2008). Women may experience increased vaginal discharge and possibly dysuria, usually within ten days of acquiring the infection (Hook and Hunter Handsfield 2008).

**Diagnosis and treatment**

Diagnosis of gonorrhoea involves testing a sample of body fluid from the vagina, cervix, anus or pharynx, or urine to see if N. gonorrhoeae bacteria are present.
Nucleic acid amplification tests are most commonly used in the diagnosis of gonorrhoea. These tests detect and make many copies of the genetic material (deoxyribonucleic acid) of *N. gonorrhoeae*, and are responsible for increasing detection rates compared with culture alone (HPA 2010). The HPA (2010) advised that nucleic acid amplification tests should be used to detect *N. gonorrhoeae* because of the higher sensitivity and specificity and quicker turnaround times for results compared with cultures. Nucleic acid amplification tests can also be used to diagnose co-infection with *Chlamydia trachomatis*. Microscopy is used in specialist centres to identify *N. gonorrhoeae* as monomorphic Gram-negative diplococci within polymorphonuclear leucocytes in samples taken from the urethra, cervix or rectum of symptomatic patients (Bignell and FitzGerald 2011).

No clear testing interval has been set by BASHH, PHE or the Society of Sexual Health Advisers, because of individuals’ differing situations. The World Health Organization (WHO) (2012) promotes early screening, diagnosis and treatment of gonorrhoea because if left untreated, the disease is associated with increased morbidity. Incomplete or inappropriate use of first-line antibiotics also affects successful treatment of gonorrhoea. This is particularly problematic in countries where antibiotics can be purchased without the need for a medical prescription (WHO 2012).

In the UK, BASHH provide advice on the treatment of gonorrhoea in adults (Bignell and FitzGerald 2011). This guidance is informed by data from the Gonococcal Resistance to Antimicrobials Surveillance Programme (GRASP) for England and Wales (HPA 2013). WHO (2012) recommends that any first-line therapy should achieve cure in at least 95% of patients. Consequently, when data from GRASP showed that *N. gonorrhoeae* resistance to ciprofloxacin had risen above 5% in 2002, a change in patient management was advocated (Bignell and FitzGerald 2011). BASHH (2012) recommended use of the third-generation cephalosporins cefixime and ceftriaxone, given the increasing resistance to ciprofloxacin. Bignell and FitzGerald (2011) advised that clinicians should follow guidance produced by BASHH when treating people with gonorrhoea, which involves use of a single dose of ceftriaxone 500mg intramuscularly in combination with a single dose of azithromycin 1g orally as first-line therapy. Box 1 outlines alternative treatments for gonorrhoea, which may be used when an infection is known to be sensitive to different antimicrobials or where the regional prevalence of resistance to these antimicrobials is less than 5%. Other treatment options can be found in the UK national guideline for the management of gonorrhoea in adults produced by BASHH (2012).

The susceptibility of *N. gonorrhoeae* to extended-spectrum cephalosporins is decreasing worldwide (Unemo et al 2010). Therefore, it is important to improve awareness of antimicrobial resistance, with recommendations to carry out frequent follow up, re-testing to ensure the bacteria have been eradicated, and confirming and reporting any treatment failures (Unemo et al 2010). The European Centre for Disease Prevention and Control (2012) has warned that gonorrhoea may become an untreatable disease if drug-resistant strains of *N. gonorrhoeae* continue to develop and spread. The GRASP action plan was devised to highlight the national and global problem of antimicrobial-resistant gonorrhoea (Ison et al 2011). Components of the action plan include monitoring of treatment failure, establishing a communication strategy and strengthening surveillance (HPA 2013).

**Sexual health education and promotion**

Nurses are in an ideal position to educate patients about sexual health, offer sexual health testing, provide treatment and advise on preventing the spread of gonorrhoea. The rates of *N. gonorrhoeae* infection are fairly evenly distributed between men and women, with an increase of 23% and 17% respectively, in England between 2009 and 2012 (PHE 2012). It is important, therefore, that public health interventions are aimed at all people at risk of gonorrhoea.

Nurses should advise patients on how to avoid infection with *N. gonorrhoeae*, as well as how to prevent the spread of infection,

**BOX 1**

**Alternative treatments for gonorrhoea**

- Cefixime 400mg orally as a single dose and 1g azithromycin orally as a single dose.
- Spectinomycin 2g intramuscularly (IM) as a single dose and 1g azithromycin orally as a single dose.
- Ciprofloxacin 500mg orally as a single dose and 1g azithromycin orally as a single dose.
- Ofloxacin 400mg orally as a single dose and 1g azithromycin orally as a single dose.
- Azithromycin 2g orally as a single dose.
- In clinically diagnosed pelvic inflammatory disease: ceftriaxone 500mg IM as a single dose, also doxycycline 100mg orally twice daily and metronidazole 400mg twice daily for 14 days.
- In male patients diagnosed with epididymo-orchitis: ceftriaxone 500mg IM as a single dose and doxycycline 100mg orally twice daily for 10-14 days.

(Bignell and FitzGerald 2011)
otherwise only a reactionary service is provided, which does not involve protecting the wider population. Nurses have a duty of care to provide information on the risks associated with unprotected sexual intercourse. At a contraceptive consultation, women should not only receive their contraception, such as an oral contraceptive pill, but should also be provided with condoms and the rationale for their use if they are at risk from STIs. Correct and consistent condom use is crucial in preventing STIs, and this should be discussed and condoms routinely offered.

The public needs to have access to understandable and appropriate information about how gonorrhoea is acquired, signs and symptoms of infection and the importance of regular testing. Outreach programmes in schools, youth clubs, bars and at community events may help to achieve this. Members of the authors’ sexual health department, for example, have attended events focusing on young people at youth clubs, MSM and women who have sex with women at Gay Pride London, the general community at borough health fairs and those attending football matches, with the aim of educating these individuals about sexual health.

Increasing uptake of testing
While individuals may choose to attend a sexual health clinic for screening, opportunistic testing at other centres could help to reach those who will not access a specific sexual health service. Women attending their GP surgery, or contraception and sexual health service for cervical smear tests and contraceptive provision may benefit from N. gonorrhoeae and C. trachomatis nucleic acid amplification tests. These opportunities may increase the uptake of testing significantly. Similarly, men could be tested via a first catch urine sample.

Some pharmacies are involved in the National Chlamydia Screening Programme (NCSP) and offer urine testing for chlamydia to individuals under the age of 25 who are filling out prescriptions for emergency hormonal contraception and other contraception, or who are purchasing condoms (NCSP 2010). This could be adapted to include the involvement of a local sexual health clinic, providing combined N. gonorrhoeae and C. trachomatis nucleic acid amplification tests through a urine sample for men and a self-taken vulva-vaginal swab for women.

By widening the NCSP criteria to include individuals of all ages, more people may access opportunistic screening for gonorrhoea and chlamydia. Practice nurses working in GP surgeries could encourage uptake of testing in the practice as well as informing patients about the NCSP when providing prescriptions.

Preventing the spread of infection
For those with gonorrhoea, Turner (2012) discussed the importance of preventing the spread of infection through partner notification. The Society of Sexual Health Advisers (2004) proposed methods of informing individuals who may have been exposed to an infection, including provider referral. This is where a staff member at the clinic, usually a nurse or sexual health adviser, informs those who may have been exposed to an infection via phone, letter or home visit. One method that is implemented at the authors’ clinic is electronic partner notification, whereby the patient provides mobile phone numbers for all recent sexual partners who are then sent a text message inviting them to attend the clinic for gonorrhoea testing because of potential exposure to the infection.

Partner notification should be carried out with all patients who are diagnosed with gonorrhoea, and all efforts should be made to contact sexual partners and offer them testing and treatment. However, success varies because patients may have difficulty providing contact details – this may be because of fear of repercussions from partners, as well as difficulty in remembering previous partners (Society of Sexual Health Advisers 2004).

Future implications
The ongoing financial burden of treating suspected and confirmed N. gonorrhoeae infections to the NHS, as well as poor physical outcomes for patients, is recognised. It has already been noted that gonorrhoea may have a role to play in subfertility. The National Institute for Health and Care Excellence (2013) states that patients should be offered three rounds of full in vitro fertilisation on the NHS. Treatment is determined by local authorities, however information from the Chelsea and Westminster Hospital NHS Foundation Trust (2012) shows that one round of treatment costs £900-£1,800. This can be compared with the much lower cost of screening and treating one person with confirmed or suspected N. gonorrhoeae infection at £92.08 (Turner 2012).

The information provided by the patient must be considered fact, although anecdotal knowledge suggests that some patients are poor historians because they cannot remember all their sexual contacts or, as Turner (2012) suggested, because they may feel embarrassed or ashamed by their activities. Hughes et al (2013) discussed the importance of obtaining a full sexual history from patients. This may be difficult to achieve and trust needs to be developed between the healthcare professional and patient because intimate questions are routinely
asked. Providing a brief but specific introduction outlining the rationale for a full sexual history and discussion about confidentiality may be helpful.

Sexual health remains an area that is not widely spoken about and remains a taboo subject in the UK. The healthcare professional should take every opportunity to emphasise the importance of good sexual health when working with the public, however brief the intervention may be. The authors have found that through attending mainstream community events, barriers can be broken down and this important subject can be brought to the public’s attention, often in a non-threatening way by, for example, combining screening with cholesterol or blood pressure screening.

**Conclusion**

Gonorrhoea remains a largely treatable STI. However, antimicrobial-resistant strains of *N. gonorrhoeae* are emerging and may result in health complications, infertility and transmission of infection. Careful attention needs to be given to the public health aspects of any STI and creation of an environment where the patient’s anxieties and concerns can be recognised and managed. Based on an up-to-date sexual history, nurses should ensure that they offer testing to all people at risk of gonorrhoea and provide individuals with the knowledge to prevent STIs through correct and consistent safer sex practices, including condom use **NS**

**References**


