STIs in children and adolescents

Karen E Rogstad

Abstract

The issue of sexually transmitted infections (STIs) in children is a complex area as there are many diverse issues to consider, including both the age and developmental stage of the child, as well as diverse methods of transmission (sexual and non-sexual), and whether sexual transmission is consensual, abusive or exploitative. One has to bear in mind not only the child's own rights but also the family context and the public interest. The definition of a child varies and the same term may be applied to an infant and to a 17-year-old adolescent. The presentation, diagnosis and management of STIs in all age groups are considered. The various methods of transmission of STIs in children and young people, and their relationship to child sexual abuse are poorly researched, but can be an indicator of child sexual abuse (CSA). The need for assessment for CSA and the conflict between child protection and the rights of young people to a confidential sexual health service are all key issues when dealing with STIs in the young.

Keywords adolescents; children; child sexual abuse; chlamydia; confidentiality; conjunctivitis; gonorrhoea; HIV; HPV; sexually transmitted infection

A child is defined by law and varies depending on jurisdiction. In England, a child is defined in law as someone up to the age of 18 years. However, physiologically, puberty marks the transition from child to adult, and the time of completion of puberty (Tanner stage 5) can vary significantly. In this article 'child' usually refers to the pre-pubertal stage.

Sexually transmitted infections (STIs) and their transmission routes, pathogenesis, presentation and treatment vary according to the age of the child and their hormonal status. A female neonate has an oestrogenized vagina as a result of maternal oestrogens. As these decrease the vaginal pH rises, falling again at puberty. This results in changes in the microbiological flora of the vagina and has implications for STI acquisition and persistence. There are also anatomical changes in the genital tract from childhood, through adolescence to adulthood.

Additionally, the diagnosis of an STI in children has many more implications than in adults, as the issue of infection in parent(s) and siblings, and the possibility of sexual abuse need to be considered. The modes of transmission of STIs are shown in Table 1.

Karen E Rogstad ***MB BS (Hons) FRCP*** *is Consultant in Genitourinary Medicine and HIV and Honorary Senior Lecturer at the Sheffield Teaching Hospitals NHS Foundation Trust and University of Sheffield Royal Hallamshire Hospital, Sheffield, UK.*

What's new?

- Continuing high levels of STIs in adolescents
- Non-invasive testing and increased use of nucleic acid amplification tests for STI diagnosis
- HIV-infected children surviving into adolescence
- Vaccination against human papillomavirus
- Increasing emphasis on child protection in sexually active young people
- Evidence-based and National Institute for Health and Clinical Excellence (NICE) guidelines on STIs as a marker of child sexual abuse
- Genital warts more likely to indicate sexual abuse than previously thought

Epidemiology

The factors associated with risk of acquiring an STI are shown in Table 2.

Children

In the neonatal period the child usually acquires an STI by vertical transmission whilst *in utero*, perinatally or in infancy via breast feeding (e.g. HIV). Sexual abuse may also occur in this age group. In infancy, infection may persist for some infections acquired vertically, but sexual abuse becomes a more important risk factor as childhood progresses, although this may be only because an older child is more likely to disclose abuse than a pre-verbal child.[1] Many studies in the past have assumed vertical or non-sexual transmission for those aged under 2–3 years, without scientific evidence.

Young people

Worldwide and in the UK, adolescents and young people under 25 years are at greatest risk of STI acquisition. In the UK only 12% of the population are 16–24 years old but they account for 65% of chlamydia (CT) and 50% of gonorrhoea (GC) diagnoses at genitourinary (GUM) clinics.[2]

Pathology and pathogenesis

The developmental stage of the child, and in particular the genital tract, affects pathogenesis. Gonorrhoea infects the columnar epithelium of a non-oestrogenized vagina causing vulvo-vaginitis in a pre-pubertal girl compared with cervicitis in a post-pubertal adolescent. The risk of pelvic inflammatory disease (PID) is relatively low in pre-pubertal girls compared with adolescents, where the immature genital tract leads to a higher risk of PID than in adult women. Herpes simplex virus (HSV) acquired perinatally is a life-threatening infection with long-term sequelae, but in an older child is usually a self-limiting illness. The pathogenesis of syphilis varies markedly according to when the infection was acquired.

Diagnosis, investigation and management[3]

STIs in children and young people may be completely asymptomatic. Testing for STIs should be considered for all sexually

Modes of transmission of STIs in children

In utero

HIV, syphilis, human papillomavirus, hepatitis B and C, herpes simplex

Perinatal

HIV, syphilis, human papillomavirus, hepatitis B and C, herpes simplex, gonorrhoea, chlamydia, trichomonas

Direct contact

- Non-sexual/auto-inoculation — human papillomavirus, herpes simplex
- Fomites — possibly trichomonas
- Sexual assault/consensual sex — all STIs

Table 1

active teenagers, and there is a national CT screening programme in England. Testing should be considered where penetrative CSA is suspected/has occurred or when symptoms or signs could have been caused by an STI.

Pre-pubertal girls should be examined supine in the frog-legged position with hips flexed and the soles of the feet touching (some may prefer knee–elbow prone position) and in the lateral position to examine the anus.[1] Assessment where CSA may be an issue should be undertaken by a specialist in child assessment and a colposcope used to record any abnormalities.

Sites to be tested depend on the symptoms, and disclosures made by the child. However, child victims of abuse often give no history of penetration or may not disclose all sites. Therefore vulvo-vaginal (VV), rectal, pharyngeal and urine samples may all be needed as well as swabs from actual lesions. Adolescents should have tests according to local protocols for adults, although because they are often less tolerant of examination, self-taken VV swabs or urine testing (less sensitive in females than VV or endocervical swabs) should be considered. Tests performed should be the smallest number possible and as non-invasive as possible to limit distress caused to the child by examination. Test methodology and interpretation in the light of positive and negative predictive values require expert advice for pre-pubertal children. For gonorrhoea, culture remains the gold standard. Where a diagnosis is made using a nucleic acid amplification test (NAAT), swabs for culture should be taken whenever possible prior to treatment. For chlamydia, the previous gold standard of culture is now rarely available. A NAAT is therefore acceptable as long as it is confirmed by a second test targeting a different gene sequence. Similarly, herpes culture has been replaced by polymerase chain reaction (PCR) testing. Serology is required for syphilis, HIV, and hepatitis B and C; it should be repeated 3 months after the last exposure, although it may become positive before then. For syphilis, a final test can be undertaken at 6 weeks if other tests are not needed, and dark-ground microscopy and PCR testing from lesions are useful in early infection.

Recommended tests are shown in Table 3.

If there are to be medico-legal proceedings a chain of evidence should be used, so that a sample can be accounted for from being taken to the test result.

Partner notification should be undertaken when an STI is diagnosed. As STIs may be a marker of CSA, practitioners should consider or suspect abuse according to recommendations in the National Institute for Health and Clinical Excellence (NICE)[4] guidelines and the Royal College of Paediatrics and Child Health (RCPCH) evidence-based guidelines.[1]

Factors affecting acquisition of STIs

Background prevalence of STI
Maternal infection/mode of delivery
Developmental stage
Type of abuse
Frequency of sexual activity and number of contacts
Trauma
Time of examination relative to abuse
Use of barrier contraception

Table 2

Gonorrhoea

Neonates

Vertically acquired gonorrhoea can cause conjunctivitis at 2–5 days. Disseminated infection with arthritis and neonatal sepsis is uncommon.

Children

Infection may occur in conjunctiva, oropharynx, urethra, vagina, endo-cervix and rectum. Infection of the vagina and urethra is usually symptomatic with discharge, causing vulvo-vaginitis in girls and urethritis in boys. Rectal infection can cause rectal pain and/or discharge. PID, perihepatitis and peritonitis may occur.

Adolescents

Symptoms and signs as for adults but increased risk of PID.

Child sexual abuse

Risk of gonorrhoea in sexually abused children is 0–4% (0–2% in UK studies). In children with gonorrhoea (non-conjunctival), sexual abuse was reported in 36–83% of 0–12-year-olds, and 90–100% of 5–12-year-olds had sexual contact.[1]

Treatment

Children with gonorrhoea should be treated with ceftriaxone IM/IV, although in the neonate its use is now controversial and cefotaxime may be more appropriate. For adolescents, cefixime should be preferred.

Investigations for STIs in sexually abused children

Culture for *Neisseria gonorrhoeae*
NAAT for *Chlamydia trachomatis*/*Neisseria gonorrhoeae*
Vaginal culture/microscopy for *Trichomonas vaginalis*
PCR from lesion for herpes simplex (and *Treponema pallidum* in some cases)
Serology for HIV, syphilis, hepatitis B and C where indicated

Table 3