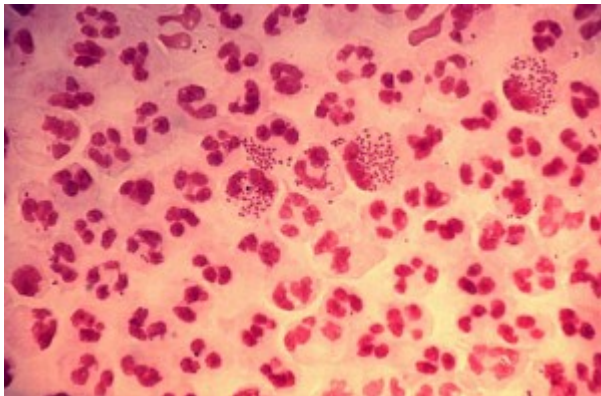


Urethritis in Adolescent Girls — Symptoms and Treatment

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Dysuria due to urethritis is a widespread problem in adolescent girls which can be caused by either a urinary tract infection or a sexually transmitted disease. The incidence of urethritis due to sexually transmitted infections is highest in sexually active adolescent girls. Cases of urethritis might be complicated by cervicitis and an ascending pelvic inflammatory disease. Therefore, girls with chronic lower abdominal pain and dysuria should undergo a pelvic exam, if possible, to exclude the possibility of pelvic inflammatory disease. Treatment with antibiotics should be started as soon as possible to avoid complications.



Overview of Urethritis in Adolescent Girls

Dysuria is a common symptom in children and adolescents that can be defined as the **feeling of pain, burning or discomfort upon urination**. Dysuria is usually caused by a urinary tract infection that involves the urethra, i.e., urethritis, but the possibility of a sexually transmitted disease should not be excluded in any adolescent girl who is sexually active. Urethritis is a lower urinary tract infection that is usually not associated with systemic symptoms.

Epidemiology of Urethritis in Adolescent Girls

Sexually transmitted diseases are common in adolescent girls for several reasons. Firstly, almost half of high school students have had at least one sexual encounter and up to one-fifth of adolescent girls have had more than four sexual partners. The use of condoms is less likely among adolescent girls compared to adults as only half of the sexually active adolescent girls used a condom.

Additionally, adolescent girls are more likely to have a sexual encounter with a male or female partner whose medical history might be unknown. Because of this behavior, the

incidence of chlamydia is twice as high among adolescent girls compared to female adults. The estimated prevalence of chlamydia among adolescent girls is around 13 to 16 % whereas the prevalence of gonorrhea is 2 to 10 %.

Symptoms of Urethritis in Adolescent Girls

Many patients, including approximately 25% of those with nongonococcal urethritis (NGU), are asymptomatic and present following partner screening. Up to 75% of women with *Chlamydia trachomatis* infection are asymptomatic.

The clinician specifically addresses the following manifestations:

- **Timing:** Symptoms generally begin 4 days to 2 weeks after contact with an infected partner, or the patient may be asymptomatic.
- **Urethral discharge:** Fluid may be yellow, green, brown, or tinged with blood, and production is unrelated to sexual activity.
- **Itching:** A sensation of urethral itching or irritation may persist between voids, and some patients have itching instead of pain or burning.
- **Menstrual cycle:** Women occasionally complain of worsening symptoms during menses.
- **Foreign body or instrumentation:** The patient should be questioned about recent urethral catheterization or instrumentation, either medical or self-induced (eg, foreign body). These procedures may cause traumatic urethritis.

Systemic symptoms

Systemic symptoms (e.g., fever, chills, sweats, nausea) are typically absent but, if present, may suggest disseminated gonococcemia, pyelonephritis, arthritis, conjunctivitis, proctitis, pneumonia, otitis media, or reactive arthritis (e.g., low back pain, iritis, or rash on the palms of hands and soles of feet).

Causes of Urethritis in Adolescent Girls

Urethritis may be gonococcal, nongonococcal, or mixed.

Gonococcal urethritis (80% of cases) is caused by *Neisseria gonorrhoeae*, which is a gram-negative intracellular diplococcus. Gonococcal urethritis has a shorter incubation period than nongonococcal urethritis (NGU), and the onset of dysuria and purulent discharge is abrupt.

NGU, which comprises 50% of urethritis cases, has a longer incubation period than gonococcal urethritis, and the onset of either dysuria or, less commonly, a mucopurulent discharge, is subacute. Patients with NGU are much more likely to be asymptomatic than are patients with gonococcal urethritis.

Commonly identified causes of NGU include the following:

- *Chlamydia trachomatis* (15-55% of cases)
- *Ureaplasma urealyticum* (40-60% of cases)
- *Mycoplasma genitalium* (15-20% of cases)
- *Trichomonas vaginalis* (<5% of cases)

Urethritis following catheterization occurs in 2-20% of patients practicing intermittent catheterization and is 10 times more likely to occur with latex catheters than with silicone catheters.

Polymicrobial NGU and cases of urethritis due to both gonococcal infection and nongonococcal factors are possible and can explain some treatment failures. This should also be considered in patients with HIV infection.

Clinical Presentation of Urethritis in Adolescent Girls

Differentiation between urethritis caused by a sexually transmitted infection and a urinary tract infection based on the clinical presentation is difficult. **Sexually transmitted infections such as chlamydia and gonorrhea are very common** in sexually active adolescent girls, and they usually present with symptoms and signs of a lower urinary tract infection, i.e., urethritis.

Such differentiation, however, between sexually transmitted infections and simple urinary tract infections, is essential as the treatment might differ.

Chlamydial infections cause dysuria that is more commonly associated with abdominal pain, vaginal discharge and vaginal bleeding. Gonorrhea can also present in a similar way to chlamydia, but it is more likely to cause proctitis or a swelling over the labia minora due to an abscess of Bartholin's gland.

On the other hand, urethritis due to urinary tract infections is usually associated with **urgency, increased frequency and gross hematuria**. Abdominal pain, vaginal discharge and vaginal bleeding are uncommon in simple cases of urethritis. A low-grade fever is more commonly seen in cases of sexually transmitted infections than in urinary tract infections.

Diagnostic Workup for Urethritis in Adolescent Girls

Most patients with urethritis do not appear ill and do not present with signs of sepsis, such as fever, tachycardia, tachypnea, or hypotension. The primary focus of the examination is on the genitalia.

The best plan is to avoid examining the patient immediately after micturition because urination temporarily washes away discharge and potentially culturable organisms. Because urine culture is an important component of the evaluation, the patient is advised to urinate approximately 2 hours before the examination so that culture and examination results are optimal, and the patient can comfortably provide a urine specimen after the examination.

The patient should be in the lithotomy position.

Inspection of the skin for any lesions that may indicate the presence of other STDs is done.

Strip the urethra by inserting a finger into the anterior vagina and stroking forward along the urethra. Any discharge is sampled for examination.

The urethral examination is followed with a complete pelvic examination, including cervical cultures.

General findings that indicate systemic disease are as follows:

- Fever
- Palmar rash

- Joint tenderness
- Conjunctivitis

Adolescent girls with dysuria should be always offered an external exam of the genitalia to exclude common causes of dysuria such as herpes simplex. If vesicles are present, the treating physician should **inquire about other common symptoms of herpes infection such as fever**, malaise, headache and muscle pain. A Tzanck test of the vesicle base can provide immediate confirmation of herpes simplex infection.

Less commonly, the genitalia examination might reveal a chancroid. Chancroids are also painful and can be associated with symptoms and signs suggestive of urethritis. Gram or Giemsa stain of the fluid from the chancroid can confirm the diagnosis.

Girls with symptoms and signs suggestive of a chlamydial infection should undergo a **pelvic examination** to confirm the diagnosis. Friability of the cervix, cervical motion tenderness and the presence of mucopus are all diagnostic of chlamydia. Additionally, the **use of urinary ligase chain reaction tests, when coupled with a swab of the vaginal vault examination**, can be enough for establishing the diagnosis of chlamydia. Gene amplification tests, i.e., polymerase chain reaction assays, can also confirm the diagnosis of chlamydia or gonorrhea in an adolescent girl with dysuria.

Adolescent girls who have abdominal pain, cervical motion tenderness and adnexal tenderness are very likely to have pelvic inflammatory disease. This condition puts the girl at an **increased risk of infertility** and a diagnostic laparoscopy might be indicated. C-reactive protein and the erythrocyte sedimentation rate are also elevated in adolescent girls with pelvic inflammatory disease. C-reactive protein levels can be also used to monitor response to treatment as they usually fall to normal limits if treatment was successful.

Urinary dipstick examination can show a positive leukocyte esterase result in urethritis due to the simple urinary tract, chlamydial or gonorrheal infections. The presence of nitrites in the urine is suggestive of a urinary tract infection.

The most commonly identified organism in cases of urinary tract infections in adolescent girls is **staphylococcus saprophytic**. The presence of pyuria, which is defined as the presence of 8 or more white blood cells per high-power field on the microscopic examination of urine, is also suggestive of urethritis. Pyuria does not differentiate between urinary tract infections and sexually transmitted infections. Microscopic examination with a gram stain can help in confirming the diagnosis especially if a single organism was seen. The presence of intracellular gram-negative diplococci on urine microscopy is pathognomonic of gonorrheal urethritis.

Urinary cultures should not be routinely performed. Complicated cases of urinary tract infections, failure to respond to antibiotic therapy within 48 hours or recurrent cases of urinary tract infections in adolescent girls should undergo a urine sample collection and culture to determine the sensitivity profile of the offending organism.

Treatment of Urethritis in Adolescent Girls

The treatment of urethritis in an adolescent girl **depends on whether the most likely etiology is a sexually transmitted infection or not**. Cases of uncomplicated urethritis or cystitis due to urinary tract infections usually respond to a three-day course of trimethoprim-sulfamethoxazole, ciprofloxacin, ofloxacin or another fluoroquinolone.

Empiric antimicrobial therapy must be comprehensive and should cover all likely

pathogens in the context of the clinical setting.

The antimicrobial options in the treatment of urethritis include parenteral ceftriaxone, oral azithromycin, oral ofloxacin, oral ciprofloxacin, oral cefixime, oral doxycycline, and parenteral spectinomycin. Azithromycin and doxycycline have been proven equally efficacious in treating *C. trachomatis* infections. Ofloxacin and azithromycin are effective for nongonococcal urethritis (NGU), whereas ciprofloxacin is ineffective against chlamydial infection. Combinations of probenecid with penicillin, amoxicillin, or ampicillin are no longer used because of resistance.

Adolescent girls who are found to have chlamydial or gonorrheal urethritis should receive **dual therapy against the two organisms** because the risk of co-infection is very high. The antibiotics of choice for the management of chlamydial and gonorrheal uncomplicated cases of urethritis are doxycycline and azithromycin plus ceftriaxone. A single dose of intramuscular ceftriaxone when combined with a single dose of azithromycin is usually sufficient for the treatment of uncomplicated gonococcal infections. Doxycycline is usually used twice a day for seven days.

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