Vulvovaginitis is a common condition in adolescents—especially sexually active girls. The diagnosis is usually confirmed by the presence of vulvitis in addition to vaginal discharge. The physical characteristics of the vaginal discharge can point towards the most likely etiology. Gram stain, wet preparations and culture, and sensitivity tests are indicated to define an exact etiology of vaginitis in the adolescent girl as the treatment is dependent on the etiology. Treatment of bacterial vaginosis is mainly metronidazole. Candida vaginitis responds well to clotrimazole. Chlamydial and gonorrheal vaginitis should be treated with azithromycin plus ceftriaxone. Trichomonas vaginitis should be treated with metronidazole.

Overview

The term vulvovaginitis is used when an adolescent develops an acute inflammation of the vulva and the vagina due to an infectious etiology. In most cases of vulvovaginitis, the patient first develops either an acute primary infection of the vulva or the vagina followed by secondary infection of the other site. Vaginitis alone is a condition that is characterized by the acute infection of the vagina without the involvement of the vulva. Patients with acute infection of the vulva usually have secondary vaginitis at the
time of presentation.

**Epidemiology of Vulvovaginitis in Adolescents**

Bacterial vaginosis is commonly seen in sexually active adolescents. An exact cause of vulvovaginitis in prepubertal girls cannot be determined in most cases; however, a specific etiology can be usually identified in adolescents. Candida asymptomatic colonization of the vagina is also very common in sexually active adolescents with an estimated prevalence of 22%.

The estimated incidence of sexually transmitted infections as the etiology behind vulvovaginitis in adolescent girls is around 18%. Candida-related vulvovaginitis has an estimated incidence of 2% among symptomatic adolescents.

![Pie chart showing etiology of vulvovaginitis in adolescents](Image)

The **most important risk factors for vulvovaginitis in adolescent girls are sexual activity**, followed by the recent use of antibiotics. The use of contraception, douching and the immune status of the patient does not seem to correlate with the risk of vulvovaginitis in adolescents.

**Other risk factors of vulvovaginitis are:**

- Unprotected sexual intercourse
- Multiple sexual partners
- New sexual partner
- History of STIs

**Etiology and Pathophysiology of Vulvovaginitis in Adolescents**

A specific etiology of vulvovaginitis can be determined in most adolescent cases. Recent sexual contact is usually evident in most cases of vulvovaginitis in adolescents. Vaginal discharge in adolescents with vulvovaginitis can be secondary to the localized inflammation of the vagina or to cervicitis.

A retained tampon has been identified as a common cause of vaginitis in adolescents. Adolescents with vaginitis due to a retained tampon **usually have a foul-smelling**
vaginal discharge. Normal physiologic leukorrhea is a common presentation in adolescent girls and should not be mistaken for a pathologic vaginal discharge.

The main causes in adolescent females are bacterial vaginosis, candidiasis, and trichomoniasis. Herpes simplex viruses and human papillomavirus can also cause vulvovaginitis in a sexually active adolescent. Sexually transmitted infections can also cause vulvovaginitis in adolescent girls.

Clinical Presentation of Vulvovaginitis in Adolescents

History taking is an essential tool for establishing the diagnosis of vulvovaginitis in adolescents. Inquiring about the presence of itching, vaginal discharge, dysuria, and redness is important. Enquiry about the quantity, color consistency, odor, presence or absence of blood, and duration of the vaginal discharge can provide crucial clues about the most likely etiology. Dysuria and pruritus is a commonly associated symptom with vulvovaginitis and, based on the presence of other indicators, can point towards poor hygiene as the etiology or a sexually transmitted infection.

Adolescents with an odorless, bloody vaginal discharge might have a history of recent vulvar physical irritation or trauma. Vaginitis can also cause a bloody discharge. Vaginitis due to trachomatous vaginalis or a retained tampon can cause a foul-smelling vaginal discharge. A greenish vaginal discharge in a sexually active adolescent who also has dysuria points towards gonorrheal vaginitis.

In contrast to children, adolescents should be seen alone and sexual history should be taken without the presence of a parent for us to get valid answers to these sensitive questions.

Physical examination of an adolescent with vulvovaginitis can be challenging. In many cases, the girl will be afraid of the pelvic examination or might have a recent traumatic experience due to sexual abuse or rape. Therefore, it is essential to explain to the adolescent what is a pelvic examination and to address any concerns before commencing the examination.

Inspection of the vulva is an important part of the examination of the genitalia. A red, edematous vulva is suggestive of candida vulvovaginitis. Small vesicles or ulcers on the vulva are suggestive of herpetic vulvitis. The presence of a greenish vaginal discharge, an abscess under the labia minora or signs suggestive of pelvic inflammatory disease is suggestive of gonorrheal vaginitis.

A speculum examination is indicated in all sexually active adolescents who present with a white vaginal discharge to exclude the possibility of candida infection. A Huffman speculum can be used in virginal adolescents whereas a Pederson speculum might be more appropriate in sexually active adolescents.

The presence of a yellow frothy discharge, a friable cervix and/or cervicitis is suggestive of Trichomonas vaginalis. A mucopurulent discharge from the cervix in a sexually active adolescent during speculum examination is suggestive of cervicitis due to gonorrhea or chlamydia.

A bimanual vaginal-abdominal exam or a rectoabdominal exam should be performed in adolescents suspected to have a pelvic inflammatory disease. The presence of cervical motion tenderness, cervical fragility and adnexal tenderness should raise the suspicion of
pelvic inflammatory disease in sexually active adolescents.

Diagnostic Workup for Vulvovaginitis in Adolescents

Once a patient presents to the clinic with symptoms and signs suggestive of vulvovaginitis, it is essential to confirm the etiology of the condition because the treatment is dependent on the cause of vulvovaginitis. The first diagnostic test would be a **gram stain of the vaginal discharge**. Additionally, wet preparations should also be performed. Wet preparations are prepared by adding one drop of saline on a glass slide and one drop of 10% KOH on the second slide.

Microscopic examination of the wet preparations can confirm the diagnosis of Trichomonas vaginalis or Candida Albicans vulvovaginitis. Wet preparations are also helpful in establishing the diagnosis of bacterial vaginosis and leukorrhea. Sheets of epithelial cells are usually seen in cases of leucorrhea whereas clue cells are usually evident in the wet preparation of a case of bacterial vaginosis.

The **pH of the vaginal discharge should also be checked** in an adolescent girl with a vaginal discharge. An elevated pH is usually associated with bacterial vaginosis or Trichomonas vaginalis infection, whereas a low pH is more likely to be seen in a case of candida vaginitis.

Sexually active adolescents with vaginal discharge who are found to be at an increased risk of pelvic inflammatory disease should receive a confirmatory test for chlamydia and gonorrhea. Polymerase chain reaction assays and culturing of the vaginal discharge are two possible ways to exclude gonorrheal and chlamydiainfection.

Treatment of Vulvovaginitis in Adolescents

The differentiation between bacterial vaginosis, candida vaginitis, chlamydial vaginitis, gonorrheal vaginitis, and trichomonas infection is essential.

The management of bacterial vaginosis should be reserved for symptomatic adolescents. Metronidazole can be given orally or as a gel preparation. Clindamycin is another reasonable option for the management of bacterial vaginosis.

Candida vaginitis can be treated with clotrimazole 1% cream, clotrimazole vaginal tablets or miconazole vaginal suppositories.

Uncomplicated cases of chlamydial vaginitis should be treated with doxycycline 100 mg twice a day for one week or azithromycin 1 gram orally. Ofloxacin is another option for the management of chlamydial vaginitis. The antibiotic of choice for chlamydial vaginitis in a pregnant adolescent is erythromycin.

Adolescent girls who are confirmed to have gonorrheal vaginitis are very likely to have a concomitant chlamydial infection. Therefore, dual treatment is recommended. Azithromycin combined with ceftriaxone or cefixime is a good option for the dual therapy of gonorrheal vaginitis.

Finally, adolescents who are confirmed to have trichomonas vaginitis and/or cervicitis should receive metronidazole 2 grams orally in a single dose. Response to this regimen is usually excellent, but the treatment of any sexual partners should be commenced to prevent recurrences.
In addition to advice regarding personal hygiene, front to back cleaning, sitz bath, avoidance of harsh irritants, douches and sexual education is a mandatory part of management.

References

Vulvovaginitis in the Child and Adolescent; Andrea M. Vandeven, S. Jean Emans; Pediatrics in Review Apr 1993, 14 (4) 141-147; DOI: 10.1542/pir.14-4-141

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