Vulvovaginal Candidiasis A Review

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Abstract

"Vulvovaginal candidiasis (VVC)" is a clinical disease that is frequently seen. At least one episode of VVC occurs in at least three-fourths of all women's lifetimes. 10 to 35% of people in India have VVC. Clinical diagnosis is frequently supported by laboratory techniques. VVC should be validated through investigative methods such as culture, particularly in challenging and recurrent cases. The majority of treatment is still azoles used topically and intravenously. Oral antifungal medications are utilized in women who have predisposed risk factors or who develop recurrent VVC. Women experiencing pruritus and vulvar discomfort may apply topical steroids. A substantial risk factor is becoming pregnant. The standard of care continues to be intravaginal azoles, which can be administered beginning in the second trimester. The management of VVCs has been made more challenging by the development of non-albicans species. In order to personalize the therapy, all women who experience vaginal discharge should receive a proper diagnosis.

Keywords: Candidiasis, Women, Pregnancy, Fungal Infection, Vulvovaginal

INTRODUCTION

A Candida infection known as vulvovaginal candidiasis (VVC) is characterized by vaginal discharge, irritation, and redness. VVC affects over 70–75 percent of women at some point in their lives. "*Candida albicans*" causes more than 90% of infections, with non-albicans species coming in second like "*C. glabrata", "C. tropicalis", "C. krusei" and "C. parapsilosis".* It contributes significantly to the need for gynecological consultations globally and has significant direct and indirect economic expenses.[1-3] VVC is caused by a number of risk factors, including prior STIs, vaginal douching, premarital sex, diabetes mellitus, pregnancy, and STIs in a sexual partner. Around 10%–20% of women have complicated VVC, which calls for the proper diagnosis. The majority of the time, the clinical diagnosis is clear. Nevertheless, severe VVC may necessitate microscopic diagnosis using KOH mount or Gram stain, immunochromatography test, and culture. In simple circumstances, intravaginal or systemic antifungal medications are effective treatments. Combining intravaginal and systemic therapy may be necessary in a complex or recurrent VVC.[4-7] It is crucial to comprehend management tactics in unique conditions and various treatment strategies given the numerous risk variables, changing illness patterns, and rising number of difficult infections. The epidemiology, management tactics, and summarized approach in numerous comorbid conditions are reviewed in this research.

EPIDEMIOLOGY

70% of women will experience candidial vulvovaginitis at some point in their lives, accounting for close to one-third of all cases. 8% of females report having VVC recur (more than three episodes per year). VVC rates ranged from 29% to 49% in a global study encompassing 6000 women from the United States and the United Kingdom, with 9% of the participants reporting recurrent VVC. Age had an effect on the cumulative chance of recurrent VVC, which by 50 years had increased to 25%.[5-8] The lifetime probability of recurrence for a specific VVC infection is estimated to be 6 to 20%. According to studies from India, adult women in the reproductive age range have a 10% to 35% prevalence of VVC that has been validated in a lab. Depending on the diagnostic standards and the existence of risk factors, the prevalence may change. Women with diabetes are more likely to have VVC. Type 1 diabetes carries a greater risk than type 2 diabetes.[1,9-12] Vaginal

Candida colonization rises from 20% to 30% during pregnancy. The second and third trimesters are when asymptomatic episodes are more prevalent. Predisposing factors for VVC in pregnancy include immunologic changes, elevated estrogen levels, and increased vaginal glycogen synthesis.[13]

RISK FACTORS

Vaginal candidiasis risk factors typically relate to blood sugar level, long-term antibiotic use, additional hormonal treatment, stress or mood change, iron deficiency anemia, and excessive cleaning of external genitalia. These factors are not related to the severity of pathogens. The following risk factors were identified in a study of non-pregnant Chinese women: prior vaginitis; frequent wearing of tight clothing; frequent intake of desserts or sweet drinks; non-use of condoms; prior uterine curettage; and having more than two partners.[14]

PATHOGENESIS

Microorganisms' defense against environmental threats makes them pathogenic. Candida species create metabolites from their metabolism and host microenvironment stimulation. Virulence factors work on host tissues and interact with the immune system, adapting to parasitism and possibly being part of cells. Each virulence component helps the yeast invade, multiply, and survive.[15,16] Physiological or non-physiological alterations induce an imbalance between vaginal protective factors and fungus virulence, allowing yeasts to colonize and grow. Therefore, this fungus and host commensalism changed, causing infection. Candida albicans can colonize without causing disease. Preserving mucosal tissue barriers, autochthonous microbiota harmony, and immune system function safeguard the organism and prevent an infectious process caused by the vaginal fungus. The fungus uses specialized tactics to grow, colonize, induce disease, and balance host defenses. Virulence and adaptability aid infection. Virulence factors include the morphological transition between yeast and hyphae forms, adhesin and invasion expression on the cell surface, thigmotropism, hydrolytic enzyme production, and biofilm formation. Certain Candida species are virulent because they switch between unicellular yeast cells and filamentous hyphae and pseudohyphae. Candida albicans, C. parapsilosis, C. tropicalis, and C. glabrata all produce blastoconidia. Filamentous forms are stronger, invade host tissues, and resist phagocytosis. In vitro experiments showed that C. albicans lacking hyphal development was less able to infiltrate tissue than wild-type strains. Phospholipase D is needed for C. albicans' yeast-to-hyphal transition, and SAP4-6 genes are expressed during hyphal growth. Candida species generate hydrolytic enzymes that aid adhesion, invasion, and tissue degradation.[17] Candida virulence is also linked to phospholipases, lipases, and hemolysins, but secreted aspartyl proteinases (Saps) are the most common. Phospholipases hydrolyze glycerophospholipid ester linkages, causing host-cell membrane degradation and yeast adherence. Candida species generate extracellular phospholipases, however strains vary.[18] Many microbial infections begin with adhesion to surfaces, suggesting early infection control. C. albicans cell wall glycoproteins and fungal surface adhesins interact with host cell extracellular matrix ligands to cause adhesion (ECM). Temperature, pH, nutrition, secretory IgA, and cellular hydrophobicity affect this interaction. Candida species can adapt to different host niche conditions such nutritional availability, pH, hypoxia, and CO2 levels, making them viable pathogens. C. albicans can utilise many carbon sources for survival and pathogenicity. Recovery of metabolic enzyme ubiquitination sites prevented catabolites from being inactivated.[17,18,19]

DIAGNOSIS

First assessment is crucial in investigation VVC. A clinical history, physical examination, microscopy, and test for STDs should all be part of the first evaluation. Treatment should start if the diagnosis of VVC is confirmed during the initial evaluation. A thorough review is required for patients whose diagnoses are ambiguous or whose symptoms return.

Clinical Examinations

The pathogen's expansion and penetration of the surface epithelial cells are linked to symptoms of VVC. Clinical information regarding sexual history, usage of contraceptives, and treatments tested, including over-the-counter medications, should be recorded when evaluating women for VVC. Ask about new allergens, topical steroid use, concomitant diabetes, recent broad-spectrum antibiotic use, urinary tract infection, venereal disease, and Covid infection, in addition to other things. Other possible symptoms include vaginal discharge, pruritus, erythema, fissures, satellite lesions, excoriation, and vulvar edema. With VVC, vulvar pruritus is one of the most common symptoms. Clinically speaking, vaginal discharge is a sign of VVC. However, not all discharges are brought on by VVC.[1,5]

Candidiasis, Trichomoniasis, Bacterial Vaginosis, Gonorrhea, Chlamydia, and Herpes Simplex are common etiologies. Sometimes there may be minimal to no vaginal discharge. If the discharge is there, it should be curd-like and barely smell. Discharge may also be fluid, homogeneous, loose, and difficult to distinguish from discharge from other sources. While though clinical symptoms and indicators might help with VVC diagnosis, not all patients receive an appropriate diagnosis based solely on clinical evaluation. The diagnosis of VVC using specific signs or symptoms has a low positive predictive value (19%).[1] Women who had been clinically diagnosed with VVC had a higher prevalence of the condition than those who had been clinically determined to be vaginosis-free (6.5% vs. 12%). Examining may reveal symptoms including vulvar edema, fissures, and excoriation markings. They might not, though, be unique to VVC. The prevalence of asymptomatic VVC in women is as high as 20%. None of the clinical symptoms are pathognomic for VVC, hence laboratory tests should be used to confirm the diagnosis.[1-8]

Laboratory assessments[20,21]

Although more than 50% of women who self-report having symptoms and indications of genital candidiasis may really have other disorders, corroborating laboratory data is required. None of the clinical criteria are pathognomonic for genital candidiasis. They consist of a vaginal fluid pH test and vaginal wall discharge.

pH test: This ought to be 4.0 to 4.5. If it is greater than 4.7, other illnesses such bacterial vaginosis, trichomoniasis, or mixed infections should be taken into account. This quick test can quickly rule out VVC or the two most frequent causes of vaginitis.

Microscopy: In addition to identifying yeast cells and mycelia on a regular basis, a wet mount or saline preparation can also be used to rule out other disorders such bacterial vaginosis (clue cells) and trichomoniasis (trichomonads). According to studies, the Gram stain of vaginal discharge has a sensitivity range of 65-85% for recognizing yeast cells or hyphae [3,109].

Culture: The gold standard for diagnosing vaginal candidiasis continues to be the recovery of yeast in fungal cultures using Sabourad's Dextrose Agar (SDA). Other media that have been employed include Nickerson's or Microstix Candida, which are thought to perform similarly to SDA.

These medium don't distinguish between the several Candida spp. Due to the relatively high likelihood of non-albicans Candida in VVC, it is occasionally important to perform tests that can tell them apart. Chromogenic Agar is regarded as an easy-to-use and trustworthy method to identify Candida and distinguish between C. albicans and other species. Despite being more expensive, it has been recommended that it might be used instead of SDA due to its benefits, which include high rates of yeast recovery, the ability to distinguish between various Candida species, and the ability to identify polyfungal populations.

Other tests: When there is a chance of antifungal resistance, susceptibility tests are thought to be the most effective for individuals who have previously received an azole treatment. They, however, are not widely accessible and are not regarded as normal treatments. Also, the species' identification can serve as a therapy guide and is strongly predictive of potential susceptibilit. VVC-causing C. species have been identified using rapid PCR-based techniques. Compared to current microscopy and culture techniques, they allegedly have higher sensitivity, specificity, and turnaround times. However, they are not thought to be clinically beneficial and are not readily available as diagnostic tests. Pap smear is insensitive even if it is specific. It is only positive in 25% of patients with symptomatic genital candidiasis and culture-positive for the condition. Serologic and antigen detection techniques are not accurate and have little clinical value.

Treatment of VVC

Women who have access to OTC remedies may be able to self-treat VVC. However, it is not advised because, in most circumstances, a clinical diagnosis may not be reliable. Whether or not VVC is difficult will determine the course of treatment. As a result, there are two types of VVC treatment: simple and difficult.

Acute uncomplicated VVC

In healthy, non-pregnant, and immunocompetent women, it is characterized by sporadic, rare bouts, mild to moderate symptoms, and a possible C. albicans infection.[1]

Uncomplicated VVC is successfully treated with short-course topical formulations (i.e., single dose and regimens of 1-3 days). Nystatin is less efficacious than topical azoles. Azole antifungal medication effectively relieves symptoms, and 80%–

90% of individuals who complete the therapy experience negative cultures. Similar to intravaginal azole therapies, topical azole therapies are effective. Fenticonazole intravaginally may be utilized. Upon topical administration, it exhibits great retention or a "intrareservoir" impact in the local tissues for up to 72 h. If the patient exhibits vulval signs, further topical antifungal treatments may be given. Yet, they occasionally have the potential to induce local irritability and even harm condoms or latex diaphragms. Patients must therefore be informed of the dangers associated with topical azole creams.[22,23,24]

Together with vaginal symptoms, vulvar involvement necessitates the application of a cream product to the inflamed area. Also, where the vulvar condition is more severe, many medical professionals combine an antifungal cream or ointment with a topical steroid for local application to the vulva. It is not essential to apply a steroid intravaginally. The length of therapy and, consequently, the drug concentration are determined by how severe the vulvovaginitis is. While more severe signs and symptoms require topical therapy for 5-7 days, mild clinical manifestations typically respond to a single dosage or brief course of therapy, or 1-3 days. Typically, follow-up is not necessary. However, women whose symptoms continue or come back after therapy should be told to schedule follow-up appointments.[24,25]

Data do not support the therapy of sex partners since simple VVC is not typically acquired through sexual activity. Balanitis affects a small percentage of male sex partners. Topical antifungal medications are helpful in treating these men's problems.[1]

Complicated VVC

Severe signs and symptoms, non-albicans infection, infection during pregnancy, uncontrolled diabetes, immunosuppressed and weak women, and repeated VVCs are characteristics of complicated VVCs.

Recurrent vulvovaginal candidiasis

A small number of women (5%) are affected with recurrent vulvovaginal candidiasis (RVVC), which is often characterized as four or more bouts of symptomatic VVC within one year. The pathophysiology of RVVC is poorly understood, and the majority of women who develop RVVC don't seem to have any underlying or predisposing factors. 10%–20% of women with RVVC have “C. glabrata” and other nonalbicans Candida species present. Traditional antimycotic medicines are less successful than C. albicans against these nonalbicans species.[1,23]

Treatment

Each RVVC episode brought on by C. albicans responds favorably to topical or oral azole therapy for a brief period of time. However, some medical professionals advise a longer course of initial therapy to try to achieve mycologic remission before beginning a maintenance antifungal regimen. The first line maintenance regimen is oral fluconazole once a week for six months. Topical medications administered on an as-needed basis can also be taken into consideration if this regimen is not practical. Effective RVVC reduction comes from suppressive maintenance therapy. After stopping maintenance medication, 30% to 50% of women will experience recurrent illness. Women with symptoms who continue to test positive for the culture despite maintenance therapy need to be handled in collaboration with a specialist.[1,23]

Severe VVC

In patients treated with brief courses of topical or oral medication, severe vulvovaginitis—defined as widespread vulvar erythema, edema, excoriation, and fissure formation—is linked to decreased clinical response rates. It is advised to use topical azole for 7–14 days or take 150 mg of fluconazole twice a day.[1]

Nonalbicans VVC

Clinicians should make every effort to rule out alternative causes of vaginal symptoms in women with non-albicans yeast because at least 50% of women with positive cultures for non-albicans Candida may be barely symptomatic or have no symptoms, and because effective treatment is frequently challenging.[25]

Treatment

Unknown is the best way to treat nonalbicans VVC. A non-fluconazole azole regimen with a longer course of treatment is an option. If recurrence happens, it is advised to take 600 mg of boric acid in a gelatin capsule once daily for two weeks. The clinical and mycologic eradication rates of this regimen are around 70%. Referral to a professional is indicated if symptoms return.[1,23,26]

Conclusion

Vulvovaginal candidiasis is a widely seen infection that frequently goes undiagnosed. A diagnosis must be confirmed by microscopy or culture because the clinical appearance alone is frequently deceptive.

When there are risk factors present, when there is recurrent VVC, or when a clinical condition warrants it, cultures should be taken. Therapy for uncomplicated VVC is common, and oral and intravaginal antifungal azoles have comparable efficacy. The presence of risk factors for VVC or recurrent, severe VVC may necessitate lengthy therapies under close observation. Oral azoles should be avoided during pregnancy. It might not be essential to treat male partners who are asymptomatic..

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