Strategies for Managing Vaginal Infection

Risav Banerjee & Trisha Bhattacharya

ABSTRACT

Vaginal Infection is the most common problem which almost most girls suffer. It is neglected but it has a serious effect if it is not treated. It is diagnosed if the color of the vaginal discharge changes, has a strong fishy odor, irritation, and burning sensation. The normal microflora of the vagina, act as the first line of defense in preventing the infection from pathogenic fungi, bacteria or protozoa which can cause vaginal infection. Several treatment strategies have been adapted for vaginal infections. Vaginitis trigger UTI (Urinary Tract Infection) in most of the girls. This review, is focused on vaginal infections caused by different types of microorganisms, symptoms and their treatment method.

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Strategies for Managing Vaginal Infection

Risav Banerjee[α] & Trisha Bhattacharya[σ]

ABSTRACT

Vaginal Infection is the most common problem which almost most girls suffer. It is neglected but it has a serious effect if it is not treated. It is diagnosed if the color of the vaginal discharge changes, has a strong fishy odor, irritation, and burning sensation. The normal microflora of the vagina, act as the first line of defense in preventing the infection from pathogenic fungi, bacteria or protozoa which can cause vaginal infection. Several treatment strategies have been adapted for vaginal infections. Vaginitis trigger UTI (Urinary Tract Infection) in most of the girls. This review, is focused on vaginal infections caused by different types of microorganisms, symptoms and their treatment method.

Author α σ: Department of Genetics, Indian Academy Degree College.

I. INTRODUCTION

A healthy vagina contains some bacteria and a few yeast cells to maintain the natural balance of the vagina, whenever the number of bacteria and yeast cells goes imbalanced it leads to several vaginal infections [1]. Irritation and swelling of the vagina and vulva with unusual vaginal discharge which has a strong odour, and pain with a burning sensation during urination, are common symptoms of vaginal infection [2].

Whenever these symptoms occur, it causes discomfort and distress which lead women to seek medical consultation [3]. In the entire world, 3 out of 4 women suffer from vaginal infections once in their lifetime. The most common vaginal infection seen in women is bacterial vaginosis caused by bacteria, Candidal vaginitis caused by the fungus, and trichomoniasis which is caused by protozoa [4, 5, 6].

II. BACTERIAL VAGINOSIS

Bacterial vaginosis is the most common infection during the reproductive age of women it causes abnormal discharge and inflammation of the vagina [7, 8]. It is the most common infection in women. Bacterial vaginosis is occurred due to the replacement of the regular Lactobacillus bacteria with Prevotella, Mobiluncus, Ureaplasma, *Gardnerella vaginitis*, Mycoplasma, and many other uncultivated anaerobes [9, 10, 11]. *Lactobacillus* which is present normally in the vagina produces bacteriocins, lactic acid, and hydrogen peroxide, which help to maintain an acidic pH, and protect against other infections in the vagina [12, 13]. An enzyme produced by the bacteria which causes bacterial vaginosis degrades the gel layer protection of the vaginal epithelium and cervical [14]. They produce inflammatory proteins which associate with complications that occur during pregnancy like preterm labor and birth [14, 15], endometritis, gynecologic surgery, *Neisseria gonorrhoeae, Chlamydia trachomatis,* pelvic inflammatory disease, increased susceptibility to HIV type 1, and herpes simplex virus type 2 [16, 17, 18].

1. SYMPTOMS

- Burning during urination
- Thin, gray, white, or green vaginal discharge
- Vaginal itching
- Foul-smelling 'fishy' vaginal odor [19, 20]

2. RISK FACTOR

Bacterial vaginosis is not a sexually transmitted infection (STI) [21], but it resembles trichomoniasis, Chlamydia, and gonorrhea which are sexually transmitted infections [22]. Douching, having male partners who have sex with other women, having a new partner, having sex with women, use of an intrauterine device, use of an inconsistent condom, cigarette smoking, and black ethnicity [23, 24]. The use of oral contraceptives has an inverse relation with acquiring bacterial vaginosis [25].

3. DIAGNOSE

Bacterial vaginosis can be diagnosed by the BV test other names are the KOH test, wet mount test, and vaginal pH test [26, 27]. BV tests are done similarly to a Pap smear or pelvic exam. For the BV test Gram stain is the criterion standard to diagnose [28]. The Nugent score which is a Gram stain scoring system for vaginal swabs to diagnose bacterial vaginosis [29], a score of 0 to 3 is considered normal vaginal flora, 3 to 7 are the intermediate which is not identified for any abnormal or normal, and 7 to 10 is over to bacterial vaginosis [30, 31]. Amsel criteria are another method to make a clinical diagnosis of bacterial vaginosis [32]. The following are considered diagnostic for bacterial vaginosis: the fishy odor of discharge, homogenous gray-white vaginal discharge, vaginal pH greater than 4.5, or clue cells on the saline wet mount [33, 34, 35].

Currently, three other tests are being practiced in clinical diagnosis: BVBLUE (Gryphus diagnostics, Knoxville, Tennessee) is a rapid point of care test when mixed with a vaginal swab it will turn blue if there is any elevation of sialidase activity is produced by the bacterial pathogens which are associated with bacterial vaginosis [36, 37].

Pip activity test card (San Diego, Quidel corporation, California) is also a rapid test for confirming bacterial vaginosis by identifying an enzyme produced by *Gardnerella vaginalis* [38].

Affirm VPIII (Becton Dickinson, Maryland, Sparks) is a DNA probe-based test that helps to measure the level of Gardnerella vaginalis [39]. All these tests perform similarly to the gram stain. One may feel mild discomfort when the speculum is put inside the vagina to take the sample [40].

There are chances of bacterial vaginosis infection to reoccur after successful treatment [41], if the diagnosed person is pregnant then it is important to treat the infection, it can cause health problems to the unborn baby [42, 43].

4. TREATMENT

For the treatment of bacterial vaginosis, the doctor may prescribe one of the following medications:

Clindamycin (Cleocin, Clindesse): it is available as a cream that is inserted into the vagina [44].

Secnidazole (Solosec): is an antibiotic taken orally in one dose. This medication comes as a packet of granules that is sprinkled onto a soft food, such as pudding or yogurt, and should eat the mixture within 30minutes, and be careful not to chew or crunch the granules [45, 46].

Metronidazole (Metrogel-vaginal, Flagyl): this medicine is taken orally as a pill, and is also available as a topical gel that can be inserted into the vagina. One can get the risk of abdominal pain, stomach upset, or nausea while using this medication. During treatment, one should avoid alcohol [47].

Tinidazole (Tindamax): even this medication is taken orally. Tinidazole also has the potential to cause stomach upset and nausea same as oral metronidazole, while treatment period one should avoid alcohol for at least three days after completing the treatment [48, 49].

III. CANDIDAL VAGINITIS

Candidal vaginitis is the second most common cause of vaginitis after bacterial vaginosis [50]. The vaginal yeast is caused by the *Candida albicans* strain, and the majority of non-albicans cases are caused by the *Candida glabrata* strain [51, 52]. These organisms may also be present in asymptomatic women [53], the non-albicans fungi are more resistant to the treatment than the Albicans species [54]. The non-albicans candidiasis strain causes severe candidal vaginitis infection, it becomes complicated in women with uncontrolled diabetes, immunosuppression or debilitation, or pregnant women. There are high chances of recurrent candidal vaginitis [55, 56].

The *Albicans candidiasis* strain causes mild to moderate candidal vaginitis, the etiology is likely to be *Candida albicans*, it is non-immuno-compromised in women and it is infrequent or sporadic [57].

1. SYMPTOMS

- Vaginal rash
- Watery vaginal discharge

- Vaginal pain and soreness
- thick, white, odor-free vaginal discharge with a cottage cheese appearance
- Irritation and itching in the vagina and vulva
- redness and swelling of the vulva
- a burning sensation, during urinating or while intercourse [58, 59]

2. RISK FACTOR

Recent antibiotic use is a significant risk factor for acquiring candidal vaginitis in women. The other risk factors are to have some type of immuno* suppressive illness, like HIV, AIDs, or diabetes mellitus [60]. Frequent Douching and wearing wet clothes for a long duration of time may also increase the risk [61].

3. DIAGNOSIS

Candidal vaginitis is mostly self-diagnosed. The clinical symptoms are the typical way to diagnose candidal vaginitis. The technical way for diagnosis requires microscopic examination of the vaginal discharge for the identification of yeast buds or yeast hyphae, which is most easily viewed in the wet mount with 10% KOH [62], it depends on the working microscope and the clinical experience of the provider and detects 40% to 70% of cases when compared to culture [63]. Sabouraud agar culture for vaginal discharge is considered the criterion standard for diagnosis, it is an expensive method and requires a long duration of time [64].

Recently the immunochromatographic method has been developed which is rapid screening tests to detect Candida infection within 30 minutes [65].

4. TREATMENT

The treatment depends on the frequency of the infections short-course vaginal therapy: an antifungal medication is taken for three to seven days which usually clears the infection. Antifungal medications are available as creams, ointments, and tablets, which include miconazole and terconazole.

- Single-dose oral medicine: a single dose of fluconazole (Diflucan) is an oral medication prescribed by the doctor, it is not recommended when one is pregnant.
- Long-course vaginal therapy: doctor prescribe an antifungal medication which is taken daily for a few weeks, followed by once a week for six months.
- Multidose oral medication: doctor prescribed two or more doses of an antifungal medication which is an oral medication for vaginal therapy, but is not recommended for pregnant women.
- Azole resistant therapy: boric acid, a capsule is inserted into the vagina. This medication can be fatal if taken orally and is used only to treat candida fungus which is resistant to the usual antifungal agents [66, 67].

IV. TRICHOMONIASIS

Trichomonas vaginalis is the most common, curable, non-viral sexually transmitted infection. It is caused by parasitic, pear-shaped, and motile protozoan, it adheres to the vaginal epithelium and releases cytotoxic substances that cause inflammation and breaks the epithelium [68]. Trichomonas vaginalis does not need cervical cells for growth like Chlamydia trachomatis and Neisseria gonorrhoeae, they are vaginal pathogens, and the whole vagina is at risk of being infected [69].

1. SYMPTOMS

- Pain during urination and intercourse
- Genital redness, burning, and itching
- A large amount of a thin vaginal discharge with a foul smell
- ❄♒♏ ❖♋♑♓■♋● discharge might be clear, white, gray, yellow, or green
- Discomfort over the lower stomach area [70, 71, 72]

2. RISK FACTOR

Lower education level, ethnicity, socioeconomic status, and douching are the risk factor for acquiring *Trichomonas vaginalis*, multiple sexual partners are also identified as risk factors [72].

3. DIAGNOSIS

The method used most often to diagnose trichomoniasis in the office setting has traditionally been a microscopic examination of saline wet mount for motile *trichomonas*, it has a

sensitivity of 50% to 60% when performed by experienced clinicians [73]. Recently developed methods for diagnosing trichomoniasis are Affirm VPIII (Maryland, Dickson, Sparks), the nucleic acid probe that evaluates for *Trichomonas vaginalis*, and in addition to the *Gardnerella vaginalis*. The sensitivity of these tests is 80% to 90%. OSOM and Trichomonas rapid test (Sekisui Diagnostics, Framingham, Massachusetts) are the rapid antigen test for trichomoniasis. If trichomonads are present then the vaginal collection swab will turn blue when it comes in contact with specific reagents [74]. It has a sensitivity rate of 83% to 90%. The result of Affirm VPIII is available within 45 minutes and OSOM Trichomonas rapid test takes 10 minutes to show the result [75].

4. TREATMENT

The only drug used for treating *Trichomonas vaginalis* are tinidazole and metronidazole [76]. The cure rate of tinidazole is 86% to 100%, whereas the cure rate of metronidazole is 90% to 95% only. Treatment is recommended for all the sex partners of women with trichomoniasis [77].

V. CONCLUSION

Vaginal infection is caused by different types of microorganism i.e. bacteria, fungi, protozoa, mycoplasma etc. Several risk factors are associated with it if not treated on time. Personal hygiene is one of the most crucial factor which girls should follow to avoid vaginal infection. Early signs and symptoms should not be avoided, the treatment should be started as soon as possible.

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