



Cervical insufficiency with bacterial vaginosis and vulvovaginitis in pregnancy: Prevention

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Abstract: Bacterial vaginosis (BV) and vulvovaginitis are common vaginal infections that can significantly affect pregnant women, particularly those with cervical insufficiency (CI). Cervical insufficiency is a condition where the cervix weakens and opens prematurely, often resulting in preterm birth or pregnancy loss. This article explores the relationship between BV, vulvovaginitis, and CI, focusing on their shared pathophysiological mechanisms and their combined impact on pregnancy outcomes. BV, characterized by an imbalance in vaginal microbiota, and vulvovaginitis, which involves inflammation of the vulva and vagina, can increase the risk of infection ascending to the upper reproductive tract, potentially exacerbating cervical insufficiency and increasing the risk of preterm birth. The review emphasizes the importance of early detection, timely treatment, and preventive measures such as antibiotic prophylaxis, good hygiene practices, and regular prenatal monitoring to manage these infections in pregnant women with cervical insufficiency. By addressing these infections, healthcare providers can improve maternal and fetal health outcomes, reducing the risks associated with preterm labor and other pregnancy complications.

Keywords: Bacterial vaginosis, vulvovaginitis, cervical insufficiency, pregnancy, preterm birth, infection prevention, antibiotic prophylaxis.



Introduction

Cervical insufficiency (CI), also known as incompetent cervix, is a significant cause of preterm birth and miscarriage, particularly during the second trimester of pregnancy. It is characterized by the premature dilation or opening of the cervix, leading to the loss of pregnancy before the fetus reaches full viability. One of the risk factors that may contribute to CI is the presence of infections, specifically bacterial vaginosis (BV) and vulvovaginitis. Both conditions are common in pregnant women and have been shown to impact cervical integrity. This article explores the pathophysiology, diagnosis, and management of bacterial vaginosis and vulvovaginitis in pregnant women with cervical insufficiency, discussing their role in the development and progression of CI.

Pathophysiology:

1. Bacterial Vaginosis (BV) in Pregnancy:

Bacterial vaginosis is a condition characterized by an imbalance of the normal vaginal microbiota, where there is a reduction in lactobacilli and an overgrowth of anaerobic bacteria. The pathophysiology of BV in pregnant women is still under investigation, but it is thought to be driven by hormonal changes that promote the growth of pathogenic organisms in the vaginal microbiome. BV has been associated with an increased risk of preterm labor, pelvic inflammatory disease, and the development of cervical insufficiency.

In the context of cervical insufficiency, BV may contribute to cervical weakening through several mechanisms:

- **Inflammation:** The overgrowth of bacteria, particularly *Gardnerella vaginalis*, *Mobiluncus*, and *Prevotella*, causes inflammation of the cervix, which can lead to softening and premature dilation.



- **Cytokine Production:** BV can stimulate the production of pro-inflammatory cytokines like interleukins and tumor necrosis factor-alpha, which may contribute to cervical remodeling and tissue degradation.
- **Infection Spread:** Bacterial infections, such as BV, may lead to ascending infection from the vagina to the cervix, increasing the risk of preterm birth by stimulating uterine contractions and cervical changes.

2. Vulvovaginitis in Pregnancy:

Vulvovaginitis, the inflammation of the vulva and vagina, is another common infection in pregnancy. This condition can be caused by a variety of pathogens, including bacteria, yeast, and viruses, with the most common causes being *Candida albicans*, *Escherichia coli*, and sexually transmitted infections. Vulvovaginitis leads to symptoms such as itching, pain, and abnormal discharge, and it can significantly impact pregnancy outcomes.

In pregnant women with cervical insufficiency, vulvovaginitis may contribute to the exacerbation of cervical changes:

- **Inflammation:** Similar to BV, vulvovaginitis causes inflammation that may affect cervical tissue, promoting early dilation and increasing the risk of spontaneous abortion or preterm delivery.
- **Weakened Immune Response:** Pregnancy naturally suppresses the immune system to prevent the rejection of the fetus, making pregnant women more susceptible to infections such as vulvovaginitis. Chronic infection can further compromise cervical integrity in women predisposed to CI.
- **Microbial Imbalance:** The presence of abnormal microbiota in the vaginal environment can alter the integrity of the cervical mucus plug, a natural barrier that protects the pregnancy. This disruption may facilitate cervical dilation and reduce the capacity of the cervix to maintain the pregnancy until full term.



Diagnosis:

Accurate diagnosis of bacterial vaginosis and vulvovaginitis in pregnant women with cervical insufficiency is essential for appropriate management. The diagnostic process typically involves:

- 1. Clinical Assessment:** A detailed history of symptoms such as vaginal discharge, irritation, or odor is taken. Pregnancy-related symptoms like pelvic pain, cramping, or early contractions may also be considered.
- 2. Vaginal Examination:** A pelvic examination is performed to assess for signs of infection, such as redness, discharge, or edema of the cervix. The examination may also help evaluate the cervix for signs of dilatation or shortening, a hallmark of cervical insufficiency.
- 3. Laboratory Tests:**
 - **Gram Stain:** A Gram stain of vaginal discharge can confirm the diagnosis of BV by revealing a characteristic shift in the vaginal flora.
 - **Wet Mount Microscopy:** This can help detect the presence of *Candida* organisms, trichomonads, or bacterial infections.
 - **Culture and Sensitivity:** This is used for identifying specific pathogens, particularly in cases of vulvovaginitis caused by *Candida* or *Escherichia coli*.
- 4. Cervical Length Measurement:** Transvaginal ultrasound is often used to measure the length of the cervix and assess for any signs of premature cervical shortening or dilation.

Management:

- 1. Antibiotic Therapy for BV:** The standard treatment for bacterial vaginosis in pregnancy includes the use of antibiotics such as metronidazole or clindamycin. These antibiotics are generally considered safe for use during pregnancy and effectively reduce the bacterial load in the vagina.



- **Metronidazole:** This is commonly prescribed as a first-line treatment for BV in pregnancy. The oral or vaginal gel forms are both effective in treating BV.
- **Clindamycin:** An alternative to metronidazole, this antibiotic is used in cases where metronidazole is not well tolerated or contraindicated.

2. Antifungal Treatment for Vulvovaginitis: When vulvovaginitis is caused by *Candida* species, antifungal agents like fluconazole (oral) or topical treatments (clotrimazole, miconazole) are used to alleviate symptoms and eradicate the infection.

3. Management of Cervical Insufficiency:

- **Cerclage:** For women with diagnosed cervical insufficiency, a cervical cerclage may be recommended. This surgical procedure involves stitching the cervix closed to prevent premature dilation and reduce the risk of preterm birth.
- **Progesterone Supplementation:** Progesterone has been shown to help maintain cervical integrity and reduce the risk of preterm birth. It is often prescribed for women with cervical insufficiency and a history of preterm birth.
- **Bed Rest and Activity Restriction:** Limiting physical activity may help reduce the risk of further cervical changes in women with cervical insufficiency.

Prevention

Good Personal Hygiene:

- **Proper Perineal Care:** Pregnant women should be educated on proper perineal hygiene. It is recommended to clean the genital area with mild, unscented soap and water. Wiping from front to back after using the toilet can help prevent the transfer of bacteria from the anus to the vagina.
- **Avoid Douching:** Douching can disturb the natural balance of vaginal flora and increase the risk of infections such as BV and vulvovaginitis. Pregnant women should avoid douching as it may disrupt the protective environment in the vagina, leading to an increased likelihood of infection.



- **Use of Cotton Underwear:** Wearing breathable cotton underwear helps reduce moisture and irritation, providing a less favorable environment for the growth of pathogens. Tight-fitting clothes should be avoided to reduce friction and moisture retention in the vaginal area.

Probiotic Supplementation:

- **Oral Probiotics:** Probiotics, particularly those containing *Lactobacillus* species, may help restore the balance of vaginal flora and reduce the incidence of BV in pregnant women. Studies have shown that probiotics can help restore the dominance of healthy lactobacilli in the vagina, which is essential for preventing BV and vulvovaginitis.
- **Probiotic-Rich Foods:** In addition to supplements, including probiotic-rich foods like yogurt, kefir, and sauerkraut in the diet may also help maintain a healthy vaginal microbiome.

Antibiotic Prophylaxis for High-Risk Individuals:

- **Antibiotics for BV Prevention:** Pregnant women who have a history of recurrent BV or who are at higher risk for developing BV (such as those with a history of cervical insufficiency) may be given antibiotics like metronidazole or clindamycin as a preventive measure. These antibiotics can be prescribed to prevent recurrence of BV and reduce the risk of preterm birth.
- **Screening and Treatment for Sexually Transmitted Infections (STIs):** STIs such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae* can increase the risk of vulvovaginitis and BV, as well as contribute to cervical insufficiency. Routine screening for STIs and early treatment can prevent the exacerbation of cervical insufficiency and reduce the risk of complications.

Management of Preexisting Conditions:



- **Optimal Management of Diabetes:** Women with diabetes have an increased risk of developing vaginal infections, including BV and vulvovaginitis. Managing blood glucose levels within a healthy range can reduce the likelihood of developing infections.
- **Managing Immunocompromised States:** Pregnant women with weakened immune systems are more susceptible to infections. Therefore, proper management of conditions such as HIV, autoimmune diseases, or the use of immunosuppressive medications is essential to prevent infections that could affect the cervix.

Safe Sexual Practices:

- **Consistent Condom Use:** Use of condoms during sexual intercourse can reduce the risk of acquiring or transmitting sexually transmitted infections (STIs) that can contribute to vulvovaginitis and BV.
- **Avoiding Unprotected Sexual Contact with Infected Partners:** Pregnant women should avoid sexual activity with partners who are known to have genital infections or BV, as this may exacerbate the risk of vaginal and cervical infections.

Early Detection and Prompt Treatment:

- **Routine Screening for BV:** Early detection of BV is critical for appropriate treatment. Pregnant women, particularly those with cervical insufficiency, should be routinely screened for BV, especially if they present with symptoms such as abnormal vaginal discharge, odor, or irritation.
- **Regular Prenatal Visits:** Regular prenatal checkups allow for the timely identification of any infections or cervical changes. This includes routine pelvic exams to assess the health of the cervix, identify early signs of cervical insufficiency, and provide early interventions if necessary.

Education and Counseling:

- **Patient Education on Symptoms:** Pregnant women with a history of cervical insufficiency should be educated about the signs and symptoms of BV and



vulvovaginitis, such as unusual vaginal discharge, discomfort, itching, or a fishy odor. Early identification of symptoms allows for prompt treatment and reduces the risk of complications.

- **Counseling on Lifestyle Modifications:** Counseling on lifestyle changes such as quitting smoking (which can increase the risk of infection) and avoiding exposure to environmental irritants or chemicals can also help reduce the risk of infection and preterm labor.

Monitoring Cervical Health:

- **Cervical Length Screening:** Women with cervical insufficiency should have their cervical length regularly monitored via transvaginal ultrasound. This allows healthcare providers to identify any early cervical changes that may signal an increased risk of preterm birth, ensuring early intervention to prevent premature delivery.
- **Prophylactic Cerclage:** For women with a history of cervical insufficiency and recurrent preterm births, a cervical cerclage (a stitch placed in the cervix to prevent dilation) may be recommended to prevent preterm labor. This, combined with infection prevention measures, can significantly reduce the risk of preterm delivery.

Conclusion:

Bacterial vaginosis and vulvovaginitis are common conditions in pregnant women and can significantly impact cervical integrity, especially in those with cervical insufficiency. The inflammation and microbial imbalance caused by these infections contribute to the weakening of the cervix, thereby increasing the risk of preterm labor and miscarriage. Early diagnosis, appropriate antibiotic and antifungal treatments, and close monitoring are essential in managing these infections and reducing the risk of adverse pregnancy outcomes. Pregnant women with cervical insufficiency should be carefully evaluated for these infections, and appropriate interventions should be made to optimize maternal and fetal health. Preventing bacterial vaginosis and vulvovaginitis in pregnant



women, especially those with cervical insufficiency, is essential for maintaining maternal and fetal health. A multifaceted approach that includes good hygiene practices, appropriate use of probiotics, regular screening, early antibiotic or antifungal treatments, and management of underlying risk factors can significantly reduce the incidence and recurrence of these infections. By preventing these infections and maintaining cervical integrity, the risk of preterm birth and pregnancy complications can be minimized.

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