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FORMATION OF INFECTIOUS DISEASES IN PREGNANCY

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Abstract:
Infectious diseases are disorders caused by pathogenic microorganisms (e.g., bacteria, viruses, fungi, parasites) that may be transmitted directly or indirectly by various sources. Some infections may be harmful, but some may be harmless; all may be preventable. Certain patient populations may also be more susceptible to infections, including pregnant women.

Keywords: vaginal infections, bacterial, infections, eczema, herpes, uterine infections, group B streptococcus (GBS), bacterial vaginosis (BV)

Infectious diseases are disorders caused by pathogenic microorganisms (e.g., bacteria, viruses, fungi, parasites) that may be transmitted directly or indirectly by various sources (e.g., person to person, insects, animals, environment, food, water). Some infections may be harmful, but some may be harmless; all may be preventable. Certain patient populations, including pregnant women, may also be more susceptible to infections.[1]

During pregnancy, some common infections that may occur are influenza, vaginal yeast infections, eczema, herpes, uterine infections, group B streptococcus (GBS), bacterial vaginosis (BV), and listeria. Changes in immune function, such as reduction in T- and B-cell activity and natural killer–cell activity and increases in dendritic-cell activity, may cause this increased risk of infection.[2,3] However, immune-system changes during pregnancy are not fully understood, and more data are needed.[4]

The severity of some infections, such as influenza, GBS, sexually transmitted diseases, urinary tract infections, and Zika virus, may also increase with advancing pregnancy.[4] Complications from severe infections during pregnancy may include preterm birth, low birth weight, birth defects, learning problems, and possibly pregnancy loss.[5-7] Prevention, early detection, and treatment are vital to help minimize and eliminate these complications with multiple available prevention and treatment strategies. The problem lies with growing and novel pathogens, as data are limited to devise a response plan to emerging infections such as the current pandemic.[4,8]

VIRAL VERSUS BACTERIAL

Many viral infections during pregnancy are considered benign; but due to the immunological changes that are associated with pregnancy, the severity of viral infections may increase.[9] In addition, there is little available information about how pregnancy affects the mother's response to viral pathogens; however, it is thought that placental response to viruses may play a role in the severity of infection.[6,9] When pandemics such as influenza, Ebola, Zika, and COVID-19 occur, it becomes challenging to prevent and treat these infections with the complexity and uncertainty of immunological changes during pregnancy.[9]

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Viruses and infections associated with pregnancy include herpes simplex virus (HSV); varicella zoster virus (also known as chickenpox); cytomegalovirus; rubella; human immunodeficiency virus (HIV); hepatitis; influenza; and Ebola.[6]

Bacterial infections may also affect women throughout their pregnancy term and the fetus and newborn. Like viral infections, it is just as important to screen, treat, and prevent these infections to decrease complications with pregnancy.[10] Bacteria and infections associated with pregnancy include GBS; urinary tract infections; listeriosis; syphilis; chlamydia; and bacterial vaginosis.[10]

COMMON INFECTIONS AND TREATMENTS

Vaginal Infections: The most common vaginal infections are listed in TABLE 1. BV, which is an imbalance of the normal vaginal flora with an overgrowth of anaerobic bacteria, is the most commonly diagnosed vaginal infection. Women may be asymptomatic or report abnormal vaginal discharge and an unpleasant odor; however, infection can lead to premature labor unresponsive to tocolytic therapy.[10] Identification and treatment may reduce the risk of preterm birth during pregnancy, and the recommended treatment for BV is oral or vaginal metronidazole or clindamycin; however, vaginal clindamycin cream is not recommended in the third or fourth trimester.[10,11]

Yeast Infection or Vulvovaginal Candidiasis: This infection commonly occurs in pregnancy due to higher estrogen levels and glycogen content in vaginal secretions.[12] Topical azole antifungals available OTC are recommended as first line with minimal risk of transfer to the fetus. A longer course of therapy of 7 days is preferred over a shorter duration.[12] Oral fluconazole may be considered as second-line therapy; short-term use of 150 mg has not been shown to have an increased risk of malformations; however, case reports do show complications at higher doses above 400 mg.[12,13]

GBS: This is the most common cause of life-threatening infections in the newborn and possibly the mother. Infections that may occur include sepsis, pneumonia, or meningitis. Universal screening at 35 to 37 weeks of gestation, and intrapartum antibiotic prophylaxis are the key prevention strategies for GBS.[14] If culture results are positive, treatment during labor is necessary with IV penicillin G (first-line preferred) or ampicillin (second-line option). Penicillin-allergic women may take clindamycin, vancomycin, or cefazolin as an alternative.[14]

RARER INFECTIONS AND TREATMENTS

Some rare infections may lead to serious complications. For example, primary HSV in pregnancy may lead to an increased risk of dissemination and hepatitis. Recurrence of HSV infection increases in frequency during pregnancy, which may lead to complications to the newborn post delivery.[4] In addition, meta-analysis results show that prophylactic acyclovir beginning at 36 weeks' gestation may reduce the risk of HSV recurrence at delivery, which may decrease risk of HSV viral shedding at delivery.[15]

When a pregnant woman infected with HIV goes into labor, the risk of transmitting HIV to the baby increases when the amniotic sac breaks. In order to protect the women's health and also to prevent mother-to-child transmission, antiretroviral therapy against HIV infection is

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recommended.[16] Guidelines recommend dolutegravir as the preferred antiretroviral therapy throughout pregnancy.[16]

Finally, syphilis in the fetus, left untreated, may cause severe complications such as stillbirth or deadly infection in the newborn. Screening is mandated early in pregnancy, and if tests are positive, treatment with penicillin G is the most effective therapy for prevention of transmission to the fetus.[17] Pregnant women with a history of penicillin allergy are recommended to be desensitized and treated with penicillin as there are no preferred alternatives.[17]

URINARY TRACT INFECTIONS

Asymptomatic urinary tract infections may occur in 10% to15% of pregnant women and can lead to complications, including premature labor.[10] A urine culture is best to be completed as part of the screening process during early pregnancy to help treat the infection early and prevent complications, such as pyelonephritis.[10] If a positive culture result exists, antibiotic therapy for 7 days is recommended to treat bacteriuria as shorter therapy is less effective. Amoxicillin, amoxicillin-clavulanate, and cephalexin are recommended therapies for urinary tract infections (TABLE 2); sulfonamides and nitrofurantoin are acceptable but have use limitations (i.e., sulfonamides are not recommended towards the end of pregnancy, and nitrofurantoin is not recommended in those with G6PD deficiency).

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