

Infections During Pregnancy

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KEYWORDS

- Congenital infection • Pregnancy complications • Vertical transmission • Zika
- TORCH

KEY POINTS

- Some common infections affect pregnant women differently and treatment options must be chosen keeping safety in pregnancy in mind.
- Certain infections can be transmitted vertically and pregnancies affected by these infections must be monitored and managed to decrease transmission.
- Some infections can be acquired in utero and can cause congenital infections in newborns that lead to developmental anomalies, affect growth, and lead to significant neonatal morbidity and mortality.

INTRODUCTION

In pregnancy, potential effects of infections on both mother and fetus must be considered. Pregnant women are at increased risk of some infections due to physiologic changes of pregnancy. Infections may cause complications with the pregnancy, and some maternal infections are transmissible to the fetus. When determining treatment, potential effects on the fetus and the pregnancy must be taken into consideration including different effects by trimester. In this article, the authors discuss common infections that require special considerations in pregnancy, infections that can be vertically transmitted, and infections that can cause in utero and perinatal infection leading to birth defects (including the classic TORCH infections).

PREGNANCY CONSIDERATIONS WITH COMMON INFECTIONS

Urinary Tract Infections

Recurrent bacteriuria and pyelonephritis are more common in pregnancy. Smooth muscle relaxation and dilation of ureters with pregnancy increases the propensity for ascending infection. Screening and treatment of urinary tract infections (UTIs)

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are more intensive in pregnancy than in the general population. Infectious Disease Society of America guidelines recommend universal screening of pregnant women for asymptomatic bacteriuria with urine culture in early pregnancy and periodic rescreening in women with positive culture during pregnancy.¹ Diagnosis is made if greater than or equal to 10^5 colony-forming units of uropathogen or greater than or equal to 10^4 of Group B Streptococcus (GBS) is present in urine culture.^{2,3} Pyelonephritis in pregnancy typically requires inpatient empirical intravenous antibiotics, with the patient switched to an oral regimen once improving and afebrile for 24 to 48 hours.⁴ Appropriate antibiotics are given for 10 to 14 days followed by suppressive therapy for the remainder of pregnancy to prevent recurrence.⁴ GBS growing in any amount in urine culture during pregnancy indicates significant anogenital colonization and therefore qualifies the woman for intrapartum antibiotics to prevent neonatal GBS disease.⁵

The pregnancy and trimester need to be considered when prescribing antibiotics. Penicillins, cephalosporins, and aztreonam are considered safe in pregnancy. Antibiotics with high protein binding, such as ceftriaxone, may cause hyperbilirubinemia in newborns if used within a day of delivery. Nitrofurantoin is associated with birth defects^{6,7} and hemolytic anemia⁸ and, therefore, is avoided in the first trimester and at term. Trimethoprim-sulfamethoxazole should be avoided in the first trimester and at term because trimethoprim is a folic acid antagonist and sulfonamides can displace plasma binding of bilirubin in newborns. Tetracyclines are avoided in pregnancy due to fetal bone and teeth developmental defects^{9,10} and fluoroquinolones are avoided due to developmental defects of cartilage in animal experiments.¹¹

Chlamydia and Gonorrhea

Chlamydia and gonorrhea are common infections that can affect pregnancy outcomes. Prevalence of chlamydia in pregnancy is 2% to 20% depending on the population.^{12–14} Newborns born vaginally to women with chlamydia are at increased risk of chlamydia conjunctivitis and pneumonia. Signs of chlamydia conjunctivitis include swelling, eye discharge, and chemosis appearing 5 to 14 days after delivery. Signs of chlamydia pneumonia include staccato cough, nasal discharge, tachypnea, and rales without fever presenting at 4 to 12 weeks of life.

Rates of gonorrhea are highest in adolescents and young adults, particular racial minorities, and in the southeastern United States.¹⁵ Gonorrhea has been associated with premature rupture of membranes, preterm birth, chorioamnionitis, small-for-gestational-age infants, and spontaneous abortion.^{16–19} Newborns born to women with gonorrhea are at increased risk of gonococcal conjunctivitis, scalp abscesses (with fetal scalp electrode placement), and disseminated gonococcal infections, which may include arthritis, sepsis, or meningitis. Gonococcal conjunctivitis causes profuse purulent exudate and swelling 2 to 5 days after birth and can cause visual impairment if left untreated.

The Center for Disease Control (CDC) and US Preventative Services Task Force (USPSTF) recommend universal screening of pregnant women younger than 25 years and older than or equal to 25 years at increased risk for sexually transmitted infections (STIs) (**Box 1**) at the first prenatal visit for chlamydia and gonorrhea.^{20–22} Retesting during the third trimester should be performed for women who remain at high risk.²⁰

Pregnant women diagnosed with chlamydia should have a test of cure collected at least 3 weeks after treatment as cure rates are decreased in pregnancy and because continued infection places infants at risk of infection.

Rising antibiotic resistance makes treatment of gonorrhea more complicated. The CDC currently recommends single doses of ceftriaxone, 250 mg, intramuscularly

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