5 ways to reduce infection risk during pregnancy

Which infections affect women more adversely during pregnancy, and how can risk of exposure to these infections be diminished?

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Pregnant women may be more severely affected by certain microorganisms than nonpregnant individuals.[1] In a recent review, Kourtis and colleagues cited evidence for increased mortality risk for pregnant patients related to 5 specific infections.[1] What are those infections and why does pregnancy put a woman at greater risk for adverse outcomes? I review these topics in this article and, based on this evidence, I suggest 5 specific ways to avoid infection during pregnancy.

Five infections that can lead to detrimental outcomes during pregnancy

Influenza

During the pandemic of 1918, maternal mortality was 27%. During the 1957 pandemic, 50% of influenza-related deaths among women of reproductive age occurred among pregnant women. In the 2009 H1N1 influenza A pandemic, pregnant women were clearly at increased risk for severe disease, reflected by an increased frequency of hospitalization and increased likelihood of admission to an intensive care unit.

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Hepatitis E

Compared with nonpregnant women and men, pregnant women also are at markedly increased risk for mortality due to hepatitis E infection, especially in Southeast Asia, the Middle East, and Africa. The pathophysiologic basis for this increase is not well understood. Interestingly, in a report from India, 33% to 43% of pregnant women infected with hepatitis E had such severe disease that they developed hepatic failure.

Herpes simplex virus

Pregnant women with primary herpes simplex virus (HSV) infection are at increased risk for hepatitis and for disseminated infection, compared with other nonpregnant adults. Only patients with obvious immunodeficiency disorders are at greater risk for disseminated HSV infection.

Malaria

Pregnant women are at significantly increased risk for acquiring *Plasmodium falciparum* malaria and developing severe, life-threatening disease. In multiple studies from the Asia-Pacific region, pregnant women have been threefold more likely to

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Don't wait for rapid flu test results. Treat your pregnant patient with antiviral therapy!

More than 17,000 deaths occurred worldwide in the 2009 H1N1 influenza A global pandemic.[1] The dominant circulating virus in the US 2013–2014 influenza season was again H1N1. In California, H1N1 accounted for about 94% of subtyped specimens.[2]

In a recent case series,[1] Louie and colleagues reviewed California Department of Public Health data on pregnant and postpartum women (6 weeks or less from delivery) with laboratory-confirmed influenza who died or required hospitalization in intensive care units in the 2013–2014 influenza season.

They found that, from September 29, 2013, through May 17, 2014, 17 pregnant women (median age, 29 years [range, 17–44 years]) with severe influenza were reported. Fifteen patients were hospitalized, 9 required mechanical ventilation, 5 required emergent cesarean delivery, and 4 died. Sixteen of the 17 patients were in the second or third trimester; one was in the first trimester. An additional patient was 36 days postpartum and required intensive care unit admission and mechanical ventilation for influenza-associated acute respiratory distress syndrome.

Only 2 patients, of the 14 with available information, received influenza vaccination during their pregnancy.

The 7 patients who tested positive for influenza by polymerase chain reaction also had rapid influenza diagnostic testing performed; only 1 patient had a positive rapid influenza diagnostic test result.

The authors point out that, although rapid influenza diagnostic tests produce very quick results, they can have poor sensitivity, depending on specimen type, patient age, and even virus type.[3] Therefore, it is imperative to begin empiric antiviral therapy promptly in a pregnant or postpartum patient who has clinical manifestations of viral influenza regardless of rapid influenza diagnostic test results or vaccination status. Such manifestations include malaise, myalgias, arthalgias, fever, chills, cough, and pleuritic chest pain.

Treat patients with oseltamivir 75 mg orally twice daily for 5 days. If a patient is unable to take oral medications, she can be treated with zanamivir, 2 puffs inhaled twice daily for 5 days. To be most effective, treatment should be started within 48 hours of the onset of symptoms.

References

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acquire malaria compared with nonpregnant individuals. In India, during the period 2004 to 2006, malaria was the most common cause of maternal death.

The most likely explanation for the deleterious effect of this particular form of malaria is the fact that the *P falciparum* parasites accumulate selectively in the placenta because they bind avidly to syncytiotrophoblastic chondroitin sulfate A. Intense inflammation in the placenta, in turn, can lead to early pregnancy loss, preterm delivery, and fetal infection.

Listeria

Another important infection to which pregnant women are particularly susceptible is listeriosis. *Listeria monocytogenes* may contaminate several types of food such as uncooked meats and vegetables, unpasteurized milk, and soft cheeses. The organism has a predilection to attack the placenta and fetus and can cause spontaneous abortion, stillbirth, preterm delivery, and neonatal infection. Hispanic women may be at unusually high risk for listeria.

Immune system changes during pregnancy

Certain subtle changes occur in the immune system during pregnancy, which may help explain the increased risk of acquired infection and subsequent adverse effects. These changes include[1]:

- Progesterone presence, which may suppress the maternal immune response and alter the balance between type-1 helper T-cell response and type-2 helper T-cell response. Type-2 cells stimulate B lymphocytes, increase antibody production, and suppress the cytotoxic T-lymphocyte response. The net effect of these changes is to decrease the robustness of cell-mediated immunity, which may impair the response of the pregnant patient to selected viral respiratory pathogens such as influenza virus.
- Increasing serum concentrations of estrogen and progesterone, which may lead to a reversible thymic involution.
- Serum concentrations of interferon-gamma, monocyte chemoattractant protein 1, and eotaxin are decreased in most pregnant women.
- Overall, serum concentrations of inflammatory cytokines are reduced and

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concentrations of cytokines that induce phagocytic-cell recruitment are increased.

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Pregnant patients clearly are not as immunosuppressed as patients receiving chemotherapy or high doses of systemic glucocorticoids. Nevertheless, the subtle alterations in their immune system just described make pregnant women increasingly susceptible to certain infections. Therefore, I suggest these take-home messages for reducing infection risk in your pregnant patients.

1. Vaccinate against the flu

All pregnant women should be vaccinated each year for influenza. If your patient becomes infected despite vaccination, treat her promptly with an antiviral medication such as oseltamivir and observe her carefully for evidence of superimposed bacterial pneumonia. If the latter complication develops, hospitalize the patient immediately and treat her with appropriate broad spectrum antibiotics. (See, "Don't wait for rapid flu test results. Treat your pregnant patient with antiviral therapy!" on page 16.)

2. Avoid hepatitis E–endemic areas

Ideally, our patients should avoid travel to areas of the world where hepatitis E is endemic. If travel cannot be avoided, the patient should receive the new hepatitis E vaccine. This vaccine is administered in a 3-dose series; in clinical trials, it has had an efficacy of 85% to 90%.[2]

If a patient acquires hepatitis E infection, she should receive aggressive supportive care, with hospitalization strongly considered because of the increased risk for hepatic failure.

The clinical manifestations of hepatitis E are very similar to those of hepatitis A: fever, malaise, anorexia, nausea, pain and tenderness in the right upper quadrant, jaundice, darkened urine, and clay-colored stools. Laboratory abnormalities in affected patients include elevated transaminase enzymes, elevated bilirubin, positive immunoglobulin M antibody against hepatitis E virus, a fourfold increase in a prior immunoglobulin G antibody titer against hepatitis E virus, and a positive test for hepatitis E RNA.[2]

3. Treat patients with HSV infection to avoid an outbreak during delivery

Pregnant women who develop primary or recurrent HSV infection should be treated promptly with therapeutic doses of acyclovir or valacyclovir. Patients with frequent recurrences should receive daily anti-HSV prophylaxis throughout pregnancy. Other patients should be treated prophylactically from week 36 until delivery.

4. Recommend malaria prophylaxis when appropriate

If your pregnant patient is traveling to an area of the world where malaria is endemic, she should receive appropriate prophylaxis, especially against *P falciparum.*

5. Vaccinate during pregnancy and promptly treat developed infections

All infections in pregnant women should be treated in a timely manner with appropriate antibiotics. Moreover, we should make a firm effort to provide all pregnant women with the following vaccinations: influenza, Tdap, and hepatitis B (if susceptible). Select patients also should receive pneumococcal vaccine (those who are immunosuppressed; have chronic medical illnessess, particulary cardiopulmonary disease; or have had a splenectomy).

FAST TRACK

Recommending, and providing, all pregnant women with indicated vaccinations will help avoid certain infections and their associated complications

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