Influenza vaccination during pregnancy

ABSTRACT

QUESTION  A 27-year-old patient of mine recently learned she is pregnant. She took the influenza vaccine offered at work when she was 7 weeks pregnant. Is her fetus at risk of malformations?

ANSWER  No evidence indicates that killed influenza vaccine is teratogenic, even if given during the first trimester. Since 1996, Health Canada’s Centre for Disease Control and Prevention has recommended that pregnant women in their second and third trimesters be vaccinated. This should not be interpreted as evidence that the vaccine is teratogenic in the first trimester because such evidence does not exist.

RÉSUMÉ

QUESTION  Une de mes patientes de 27 ans a récemment appris qu'elle était enceinte. Elle a reçu un vaccin contre la grippe qui était offert en milieu de travail lorsqu'elle en était à la septième semaine de grossesse. Le fœtus risque-t-il de présenter des malformations?

RÉPONSE  Aucune donnée scientifique ne fait valoir qu’un vaccin inactifié contre l’influenza soit tératogène, même s’il est administré durant le premier trimestre. Le Centre de prévention et de contrôle des maladies de Santé Canada a recommandé la vaccination des femmes enceintes durant les deuxième et troisième trimestres. Ceci ne devrait pas être interprété comme une preuve que le vaccin est tératogène durant le premier trimestre, car de telles données scientifiques n’existent pas.

Influenza is an acute respiratory illness brought on by virus types A or B. The disease causes rapid onset of fever, myalgia, malaise, sore throat, and non-productive cough. The incubation period is 1 to 3 days, and the virus can undergo transition up to 7 days after the onset of illness. Complications, such as pneumonia, exacerbation of chronic illness, and even death, have been reported in North America during influenza epidemics.1,2

Influenza vaccine consists of purified virus proteins. Because the virus changes its antigenic profile almost every year, researchers predict the influenza antigenicity of the three most common strains of the virus, and the vaccine is prepared based on that. That is why annual immunization is needed.

The influenza vaccine is safe, effective, and cost-effective,3 and could prevent illness in 70% to 90% of healthy people younger than 65 years.4 The government of Ontario has recently decided to immunize all high-risk populations.5 Adverse effects of the vaccine include a mild form of influenza and allergic reactions in people with allergy to eggs (the vaccine is manufactured using an egg substrate). Severe adverse effects are rare; Guillain-Barré syndrome occurs in about 1 of every million people vaccinated.6

Pregnant women face an increased risk of morbidity and stillbirth if they get influenza, as was shown...
in a few outbreaks in the 1910s and 1950s. Women with medical conditions that increase their risk of complications from influenza, such as chronic pulmonary or cardiac illness during the year before conception, should be vaccinated. In 1996, Health Canada’s Centre for Disease Control and Prevention added pregnant women in their second and third trimesters to the list of high-risk populations they recommended be vaccinated (http://www.cdc.gov/ncidod/diseases/flu/fluvac.htm).

Studies
One case report described a baby girl born with cerebral malformations characterized by developmental arrest late in the first trimester of gestation. Her mother had received influenza vaccine 6 weeks after conception and had been ill for 2 weeks following that. The authors could not conclude whether the vaccine was teratogenic or whether the vaccination and malformations appeared coincidentally.

Two studies prospectively investigated the effects of the vaccine on maternal health and outcomes of pregnancy and on the health of the infants at 2 months old. Sumaya and Gibbs reported on a study of 56 women who received inactivated influenza A/New Jersey/76 virus vaccine during their second and third trimesters. No severe immediate reactions or increased fetal complications associated with administration of the vaccine were observed. Deinard and Ogburn reported the outcomes of the pregnancies of 189 women who received the same vaccine. Their longitudinal, prospective study found no association between immunization and maternal, perinatal, or infant complications. Study women were compared with 517 pregnant women who did not receive the vaccine. No teratogenicity was observed, and the two groups of infants were similar in physical and neurologic development at birth and at 8 weeks old.

Influenza antigens
Because maternal influenza antigens can cross the placenta, vaccinating pregnant women could provide newborns with high antibody titres to the influenza virus that would protect them until self-immunization is likely to be protective. Sumaya and Gibbs reported that the 56 women in their study responded to the vaccine the same way non-pregnant adults did. At delivery, almost half of 40 maternal-fetal pairs had notable antibody titre levels in neonatal cord serum. At 6 months old, only one infant had a detectable antibody level. The authors recommended administration of a more potent influenza vaccine.

Conclusion
The risk of maternal and fetal morbidity and mortality from influenza seems to be greater than the theoretical risk of adverse effects on pregnancy outcome posed by the killed virus vaccine. There is no evidence that the vaccine is teratogenic, even if it is given during the first trimester.

References