

CID Article Key Points: Influenza Vaccine Effectiveness Among Pregnant Women, 2010-2011 and 2011-2012

CDC Influenza Division Key Points

Summary Messages

- Studies have shown that pregnant women are vulnerable to severe disease and secondary complications from influenza infection. Therefore, CDC and the Advisory Committee on Immunization Practices recommend influenza vaccination for all pregnant women to help protect them and their unborn babies from flu.
- According to recent vaccine coverage reports, influenza vaccination rates have risen to about 50% among pregnant women.
- A new study recently published in the journal *Clinical Infectious Diseases* examines the effectiveness of seasonal trivalent influenza vaccine (TIV) in pregnant women over two influenza seasons, 2010-2011 and 2011-2012. (The article is available at <http://cid.oxfordjournals.org/content/early/2013/11/25/cid.cit750.abstract>.)
- This case-control study is the first to assess vaccine effectiveness (VE) of TIV in pregnant women using laboratory-confirmed influenza outcomes (i.e., a positive influenza test result as confirmed by RT-PCR). Previous studies have compared rates of non-specific respiratory illness among vaccinated and unvaccinated pregnant women rather than laboratory-confirmed outcomes.

VE Results

- Results of the study indicate that influenza vaccination reduced the risk of acute respiratory illness (ARI) associated with laboratory-confirmed influenza among pregnant women by one-half. Vaccine effectiveness estimates observed in this study are similar to VE observed among all adults during the 2010-2011 and 2011-2012 flu seasons.
 - The adjusted VE estimates using the influenza negative controls was 44% (95% confidence interval [CI]: 5% to 67%) and using the matched ARI-negative controls was 53% (95% CI: 24% to 72%).
 - VE models adjusted for age, race, ethnicity (Hispanic), high risk medical conditions, study site, season, and days since illness onset when tested.
 - Secondary analyses indicated that the VE estimates were similar across seasons and by influenza subtype/type.
 - Among influenza cases, 42% were vaccinated compared to 58% vaccinated among influenza-negative controls and 63% vaccinated among matched ARI-negative controls.
 - Of the 100 influenza cases identified in the analysis, 45 were infected with 2009 H1N1, 33 with H3N2, 1 with an un-subtyped influenza A virus, and 21 with influenza B viruses.
- Getting a seasonal flu vaccine each year remains the best way to prevent the flu.
- However, this study and other data suggest some pregnant women will get the flu, despite having been vaccinated.
- Therefore, clinicians and the public should be aware that antiviral medication may be used as a second line of defense against flu. CDC's influenza antiviral treatment recommendations are available at <http://www.cdc.gov/flu/antivirals/index.htm>.

VE based on prior vaccine exposure

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- Based on previous reports of differences in VE depending on prior vaccine exposure, researchers also investigated whether VE among pregnant women differed depending on the prior influenza season's vaccine history.
- VE was estimated for three categories of vaccine exposure: vaccine receipt during (1) prior season only, (2) current study season only, and (3) both seasons.
- Results showed that the effect of current season vaccination may not be independent of prior season vaccination. However, women who received a flu vaccine during either flu season or in both flu seasons had similarly reduced likelihoods of having influenza infection.
- The results of this study indicate that the influenza vaccine appears to be as effective for pregnant women as it is for other adults.
- These results support the importance of continued vaccination among all pregnant women.

Background

- Data for this VE evaluation were collected from participants enrolled in Kaiser Permanente in two metropolitan areas in Oregon and Northern California who had had at least prenatal visit.
- Respiratory specimens were collected using nasopharyngeal swabs and tested using RT-PCR.
- Researchers compared the proportion vaccinated among 100 influenza cases (confirmed positive for influenza with RT-PCR) with the proportion vaccinated among 192 controls with ARI who tested negative for influenza and 200 secondary controls without ARI (matched by season, site and trimester). (See the case and control definitions used in this study below.)
 - *Cases*: pregnant women with ARI with RT-PCR-confirmed influenza virus infection
 - *Controls*: pregnant women with ARI who tested negative for influenza
 - *ARI-negative controls*: pregnant women without ARI; these were used as secondary controls in the present analysis
- This test-negative design used in the study is believed to minimize potential bias to VE estimates introduced by participants' health seeking behavior.
- Most of the influenza cases (83%) and the influenza-negative controls (79%) were seen by a health care provider.
- Most cases and controls were in their second or third trimester (82%), and most did not have a pre-existing high-risk medical condition (80%) or have pregnancy complications (79%).

Influenza Vaccination in Pregnant Women

- Getting a flu shot protects pregnant women from the flu. Studies also suggest that getting a flu shot while pregnant can decrease an infant's risk of getting the flu for up to 6 months after birth.
 - Pregnant women are more likely to become severely ill with the flu than women who are not pregnant.
 - Pregnant women with the flu have a greater chance for serious problems for their unborn baby, including premature labor and delivery.

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- Getting a flu shot is the best way to protect pregnant women from the flu and prevent possible flu-associated pregnancy complications.
- Pregnant women should talk to their doctor about flu vaccination during pregnancy.
- Babies younger than 6 months of age are too young to get a flu vaccine. To protect a baby who is younger than 6 months from getting the flu, their mother should get a flu shot during her pregnancy. An additional recommended way to protect the baby is for all of the baby's caregivers and close contacts (including parents, brothers and sisters, grandparents and babysitters) to get vaccinated against the flu.
- For more information about pregnancy and flu, visit <http://www.cdc.gov/flu/protect/vaccine/pregnant.htm>.