Case Reports on Maternal and Fetal Outcomes After Exposure to LAIV During Pregnancy

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Introduction

- The Centers for Disease Control and Prevention Advisory Committee on Immunization Practices recommends vaccination against influenza for pregnant women.[1]
- Live attenuated influenza vaccine (LAIV) is not recommended to be administered during pregnancy; rare inadvertent administration of LAIV to pregnant women does occur.
- There are limited data regarding fetal or maternal outcomes after LAIV administration during pregnancy.
  - Fetal outcomes among 6 individuals <18 years of age who were exposed to LAIV during pregnancy have been described. Among these pregnancies, there were 5 full-term healthy infants and 1 preterm delivery.[2]
  - A Vaccine Adverse Events Reporting System (VAERS) analysis described 2 women exposed to LAIV while pregnant; neither experienced any known adverse consequences.[3]

Objective

- To analyze clinical trial and case report data regarding maternal and fetal outcomes for women exposed to LAIV during pregnancy

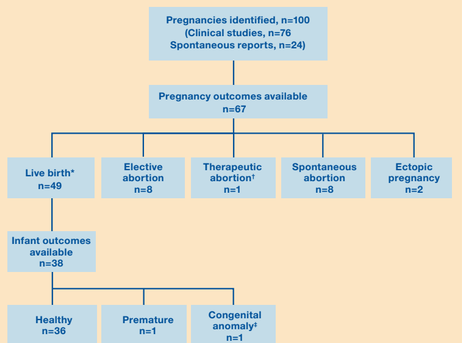
Methods

- All reports of women exposed to LAIV during pregnancy were collected and reviewed using data collected from clinical trials (September 1997 through April 2008) and spontaneous postlicensure reports (August 2003 through April 2008).
- All available information on maternal and fetal outcomes was analyzed.
  - Adverse event data were obtained from pregnancy narratives.

Results

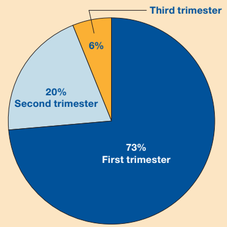
- LAIV vaccination during pregnancy was reported for 76 women across 10 clinical trials and 24 women in postliscensure reports **(Figure 1)**.
  - 29 pregnancies could be definitively classified as high risk based on maternal age <18 y (n=17) or >35 y (n=12).
- A total of 58 subjects had available data for their last menstrual period; of these, 49 had their last menstrual period before or at the time of vaccination.
  - Among these 49 subjects, 36 vaccinations occurred during the first trimester (73%), 10 during the second trimester (20%) and 3 during the third trimester (6%; **Figure 2**).
  - 9 subjects had their last menstrual period after vaccination (range; 3–147 d postvaccination).

Figure 1. Pregnancy and Fetal Outcomes



*Including one set of twins.
†Performed in a woman who had a menstrual period 2 months after vaccination and then became pregnant with a twin gestation that included a nonviable acardiac twin; acardia is a rare anomaly found only in monozygotic twin pregnancies.
‡Clinodactyly occurred in the child of a 31-year-old female who received LAIV during the late second trimester; clinodactyly is a minor congenital malformation in which the fifth finger curves towards the fourth finger.

Figure 2. Trimester of Exposure (n=49)



- Information regarding pregnancy outcomes was available for 67 LAIV recipients (mean age, 27 y; range, 14–40); 49 live births, 8 spontaneous abortions, 8 elective abortions, 2 ectopic pregnancies, and 1 therapeutic abortion were reported.
- Among the live births with additional information available (n=38), 36 infants were described as "healthy", 1 infant was premature (32 weeks gestational age), and 1 infant was diagnosed with clinodactyly.
- Available data regarding maternal adverse events (AEs) were summarized for the period of 21 days after receipt of LAIV and from vaccination to delivery (for those without information regarding the timing of events in relationship to vaccination).
  - 4 women reported adverse events within 21 days of receiving LAIV. The most common AEs were headache (n=2) and sore throat (n=2; **Table 1**).
  - 21 women reported AEs from the date of vaccination to the date of delivery. The most common AEs were anemia (n=4), upper respiratory tract infection (n=4), and abdominal pain (n=3; **Table 2**).
  - 20 women reported common complications of pregnancy including vaginal bleeding (n=9), cramping (n=3), and irregular contractions (n=2; **Table 3**).

Table 1. Unsolicited Adverse Events Within 21 Days of Vaccination*

Adverse Event (N=100)	%
Any	4
Headache	2
Sore throat	2
Abdominal pain	1
Fatigue	1
Fever	1
Sneezing	1
Threatened abortion	1

*Timing of adverse events in relationship to vaccination was frequently not recorded.

Table 2. Unsolicited Adverse Events From Date of Vaccination to Date of Delivery*

Adverse Event (N=100)	%
Any	21
Anemia	4
Upper respiratory tract infection	4
Abdominal pain	3
Anxiety	2
Back pain	2
Condyloma	2
Emesis	2
Group B streptococcal colonization	2
Urinary tract infection	2
Urticaria	2
Arthralgia	1
Chlamydia infection	1
Decreased appetite	1
Depression	1
Dizziness	1
Fall	1
Fever	1
Gonococcal infection	1
Human papilloma virus infection	1
Hypotension	1
Influenza†	1
Ingrown toenail	1
Nausea	1
Pleuritic chest pain‡	1
Rash	1
Syncope	1

*Timing of adverse events in relationship to vaccination was frequently not recorded. Does not include events noted within 21 days.
†Spontaneous report of an individual having a positive influenza culture at an unknown time postvaccination.
‡Subject developed chest pain of unknown etiology 6 months postvaccination.

Table 3. Obstetrical Conditions From Date of Vaccination to Date of Delivery*

Adverse Event (N=100)	%
Any	20
Vaginal bleeding	9
Cramping	3
Irregular contractions	2
Oligiohydramnios	2
Placenta previa	2
Proteinuria	2
Threatened abortion	2
Gestational diabetes	1
Hypertension	1
Intrauterine growth retardation	1
Placental abruption	1
Pre-eclampsia	1
Preterm labor	1
Threatened labor	1
Uterine fibroid	1
Vaginal discharge	1

*Timing of adverse events in relationship to vaccination was frequently not recorded.

Conclusions

- **The majority of inadvertent vaccinations with LAIV occurred during the first trimester, a period in which pregnancy may not have been detected.**
- **The observed rates of spontaneous abortions, ectopic pregnancies, preterm deliveries, and congenital anomalies are similar to rates described for US pregnant women overall.[4-7]**
- **In this limited cohort, inadvertent exposure to LAIV during pregnancy did not appear to be associated with any significant maternal or fetal adverse events.**

References

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