

Tdap vaccination during pregnancy to reduce pertussis infection in young infants

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Abstract

Question What is the basis for the new recommendations to vaccinate pregnant women against pertussis after the first trimester?

Answer There have been outbreaks of epidemic proportions of pertussis, mostly among young infants who have not received sufficient passive immunity from their mothers. This strategy of vaccination during pregnancy aims at stopping these life-threatening epidemics.

La vaccination Tdap durant la grossesse pour prévenir la coqueluche chez les jeunes enfants

Résumé

Question Sur quoi les nouvelles recommandations de vacciner les femmes enceintes contre la coqueluche après le premier trimestre se fondent-elles?

Réponse Il s'est produit des flambées de coqueluche de proportions épidémiques, surtout chez les jeunes enfants qui n'ont pas reçu suffisamment d'immunité passive de leur mère. Cette stratégie de vaccination durant la grossesse vise à mettre un terme à ces épidémies dangereuses pour la vie.

In late January 2013, the Centers for Disease Control and Prevention Advisory Committee on Immunization Practices (ACIP) released a revised adult immunization schedule that recommended administering a dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) to all women during each pregnancy, regardless of immunization history.¹ This is a change from the 2011 recommendations, which reported that only women who had never received Tdap or those for whom it had been 10 or more years since their previous boosters should get a dose of Tdap during pregnancy.² Both sets of recommendations advise that a dose of Tdap be administered immediately after delivery if a woman has not received the vaccine during pregnancy.

This new recommendation for Tdap dosing during every pregnancy might initially appear extreme to both clinicians and patients, but the recent pertussis outcome data emphasize the seriousness of the situation. In 2012, the Centers for Disease Control and Prevention received more than 41 000 reports of pertussis infection in the United States (US), with 18 deaths. Most of those who died were unvaccinated infants younger than 3 months of age.³ Since 2000, most deaths and hospitalizations related to pertussis have been in unvaccinated infants younger than 3 months of age.⁴ In Canada, approximately 2500 cases were reported in 2012, with increased rates

in New Brunswick, southern Alberta, Fraser Valley in British Columbia, and parts of southwestern Ontario.⁵ One fatality was reported in a 1-month-old infant from Lethbridge, Alta.⁶

The concept of vaccinating during pregnancy to protect the fetus is not new. Maternal vaccination has been shown to be safe and immunogenic with tetanus toxoid⁷ and trivalent influenza vaccine.⁸ The ACIP recommendations stress that vaccination with Tdap between 27 and 36 weeks' gestation provides maternal protection and maximum antibody transfer to the fetus.¹ While immunoglobulin G subclasses are transferred in seropositive mothers who have not received Tdap doses during pregnancy, offspring are generally not adequately protected, as demonstrated by low titres and rapid antibody decay.⁹ In a 2011 study, newborns whose mothers received Tdap during pregnancy were significantly more likely to have protective antibodies against pertussis than newborns whose mothers did not receive Tdap during pregnancy (OR 11.32, $P < .001$ for anti-pertussis toxin antibody).¹⁰ In addition, the recommendation to vaccinate during each pregnancy is based on considerations of high pertussis rates, low vaccination rates in pregnant women, and hesitancy among health care providers to vaccinate when maternal Tdap history is unknown. The importance of vaccinating during each pregnancy is emphasized by

the case of a 40-day-old baby who died from pertussis; the baby's mother had received a postpartum Tdap dose 2 years earlier, but she developed a cough illness a week before delivery.¹¹

The safety of the Tdap vaccine during pregnancy is well established. Data from the Vaccine Adverse Event Reporting System, Sanofi Pasteur, and GlaxoSmithKline pregnancy registries and small studies did not suggest any elevated frequency or unusual patterns of adverse events in pregnant women who received Tdap.² However, the ACIP conclusion is that administration of Tdap after 20 weeks' gestation is preferred in order to minimize the risk of uncommon adverse events and the possibility that any spurious association between Tdap-related adverse events and another illness might appear causative.²

A concern with current Tdap-dosing regimens is the issue of waning pertussis protection in adolescents and adults. A review of the literature has shown that protective immunity against pertussis wanes 4 to 12 years after the last immunization.¹² A 2006 to 2011 California cohort of children demonstrated decaying protection against pertussis during 5 years after a child's fifth dose of the diphtheria and tetanus toxoids and acellular pertussis vaccine.¹³ This waning might be one of the causes of reported increased infection in adolescents in Canada¹⁴ and the US,¹⁵ which increases the risk of transmission to infants. While the "cocoon" method of vaccinating parents and all close contacts immediately after delivery is commonly employed to reduce infant infection,^{16,17} this practice has been proven ineffective and resource-heavy in Canada.¹⁸ Therefore, Tdap vaccination for pregnant women might be a more viable option to reduce pertussis transmission to unvaccinated newborns.

Because most pertussis-related hospitalizations and deaths are in infants too young to be vaccinated, and because other protective methods such as cocooning have not been shown to be effective, the ACIP recommends that all pregnant women receive a dose of Tdap during every pregnancy. This recommendation is based on the large body of safety data for the Tdap vaccine and the fact that vaccinating during pregnancy is the best current method for reducing the risk of pertussis infection in young unvaccinated infants. Family physicians should be aware of these new guidelines in the US and their importance in preventing death and severe harm in such a vulnerable population. 🌿

Competing interests

None declared

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